



FRIDAY, JULY 11.

Contributions.**Detentions to Cars in New England.**

TO THE EDITOR OF THE RAILROAD GAZETTE:

With reference to Mr. Hill's letters of the 3d and 10th ult., I must confess that I have not visited the Boston Clearing House, nor, if I did so, do I think I would be able to consistently change my opinion in a single particular.

I assure Mr. Hill that I have had an extended experience in connection with the workings of his Association, having been for a great number of years car accountant of roads that had from three to four hundred cars each month in New England—much to their cost be it said—and during that time I held, and still hold, that the *Boston Association is comparatively useless*, i. e., compared with the advanced system of car service in vogue on the majority of roads on the continent.

From the action taken at the last Car Accountants' convention, it will be seen that I am not alone in this opinion, and I feel assured that the majority of car accountants on this continent will not only cheerfully bear me out in what I said in my letter, but we are prepared to bring innumerable positive proofs that our cars have been abused, diverted and used locally on New England roads, although tracers might be sent to Mr. Hill repeatedly, asking for the return of cars, and the misuse constantly brought to his notice.

If Mr. Hill has the power to prevent it, will he kindly inform me why this occurs?

Will Mr. Hill please answer the following:

- When tracers are sent him for cars, does he, as is the custom on outside roads, locate the car, advise the superintendent of the location, and see that the car is sent home with reasonable dispatch?

- When a car is diverted, or is being used locally, does he bring the matter before the notice of the chief officer of the road at fault, and endeavor to prevent a repetition?

- When cars arrive at destination, what action does he take to have them unloaded and hurried home?

These are questions which car accountants would like to have fully answered.

In all properly organized car service departments, when a foreign car arrives at destination, a request is sent to agents to have cars unloaded promptly, and sent home without delay. Does Mr. Hill do this, or does he wait until it is traced for by the owners?

The Clearing House at Boston has been for years a stumbling block in the way of improved car service, and it is a matter of surprise that, notwithstanding its inefficiency has been condemned by the majority of the principal railroad officers, it has existed so long.

Surely when the car accountants of every road outside of New England are continually complaining, there must be something wrong. And if foreign cars are so delayed, would not it be advisable for the members of the Association to ascertain if their own cars could not perform greater service than they do at present?

It is certainly—or ought to be—a matter of great moment to them, to ascertain whether they could improve the service of their cars on their own roads.

Let each New England road have a car accountant of its own—adopt a system of tracing on its own line, and thereby prevent any unnecessary delays, to its own and foreign cars. That such a system would enhance the earnings of their own cars, is a fact patent to all roads that have a properly organized car service department, and no one who has carried out the principle will deny that it would not only correct the evil complained of, but would be a source of greatly increased revenue from cars belonging to New England roads, and consequently reduce the amount they pay for hire of foreign cars.

CAR ACCOUNTANT.

July 7, 1884.

The Action of Truck Wheels on Curves.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Several years ago, while engaged on railroad construction in a coal region, I noticed a tramway about six miles in length laid between one of the mines and a navigable river.

The gauge was about 3.5 feet, oak rails, sandy soil, sharpest curvature about 150 ft. radius, and the line had been located and built without any instrumental help whatever.

The motive power consisted of about 60 mules, with an average of one-third in repair shops; they were used in tandem teams of two, with two loaded cars down and two empties up as load. These cars held about two tons each, had four 12-in. flanged cast-iron wheels loose on rigid axles, wheel base about 4 ft.

It is evident that no extreme precision has been used in gathering data; the mules were not weighed, no levels were run, and no angles measured; no velocity observations were taken otherwise than noticing that the motive power always walked, and slowly. However, they are ample and near enough.

The most striking peculiarity of the road was the extreme super-elevation of outer rail on all curves, even on those of large radius, it being so great at some points that the utmost care was necessary in driving, to prevent cars being tipped over to inside of curve. On the sharpest curvature, the outer rails were protected on inner top angle by iron

straps spiked thereon, and on such curves the super-elevation was less than that on undefended curves. Careful inquiry developed the fact that all curves had been originally laid the same as straight line, i. e., no difference of elevation of rails; that the outer rail had gradually been raised to prevent the wheels running over it, and that the strapped rails were the result of excessive wear and an attempt to remedy same.

Let us drop this for the present and look at some outside data.

At Longview, Texas, a road was started by a lumbering firm, and a wooden tramway was laid for a few miles with a gauge of 3 ft. An ordinary 15-ton 8-wheel locomotive was purchased; the tramway was then brought to good alignment, with 6° maximum curvature, with reasonably good surface, but oak rails, soil, sandy.

The engine spent so much time off the track at curves that the attempt to use it was abandoned. The firm at same time running short of funds, the engine was permanently side-tracked.

Again, on examination of locomotives in repair shops, it will be found that where the forward truck wheels are not considerably tread-worn, the flanges are badly worn. It is also well known that an engine used for switching in yards cuts away the driven flanges rapidly.

Now it seems to me that we have here the key to the action of the ordinary truck wheels on curves, and the cause of wear of outer rails; instead of the centrifugal force, which can be easily neutralized, or improper coring or want thereof, the great cause of rail wear is the pressure of flange against the inner side of rail, said pressure being sufficient in amount to slide the wheels laterally through the distance due to curvature, overcoming an amount of frictional resistance varying as the surfaces in contact.

The coefficient of this friction is probably that of moving friction for the materials, on account of the continual state of vibration of both bodies.

If the rails were perfectly rigid and speed low the coefficient would be that for starting friction, for two or more bodies in contact moving in the same direction at the same velocity are relatively at rest.

In the case of an ordinary 8-wheel locomotive, the centre of rotation is probably at tread contact of rear inner driver, the rotative pressure applied at the outer flanges of forward truck, and the forward drivers are slid laterally inward by this pressure applied at centre-pin of forward truck, the frame being rigid.

If the track gauge is widened, as it should be, and the longest wheel-base be no longer than the engine wheel-base, as is doubtless proper, the gauge will then be perfectly free for car trucks, and all work of turning train will be done by outer rail of curve and the in draught from locomotive, this in draught varying directly as train resistance at any given point, and as line of angle covered by distance between coupling points, greatest at rear of locomotive and zero at rear end of last car in train.

This brings us to the rather curious conclusion, that, within practical train lengths, the longer the train the less resistance the first few cars offer when the entire train is on a curve.

Now let us return to our coal tramway for the whys.

The coefficient of sliding friction between the wheel-tread and the sand-filled fibrous face of the oak rail was probably not less than 0.5, probably more—at any rate excessive; and the wheel, being unable to slip, raised itself on the inclined plane of the flange surface against the top inner edge of the outer rail, until slipping took place, and on sharp curvatures the edge of the flange meeting the rail at a comparatively large angle, the wood was rapidly cut down and worn away, forming an inclined plane that allowed an easy passage for the wheel across the rail; on adding a strap to stop wear, the coefficient of friction was reduced at least one-half, probably more.

Centrifugal force at three miles per hour barely needs mentioning, and a tight gauge is rapidly widened (and was widened) in more ways than one.

On the light curves the sloping outer face of the flange met the rail, and the weight was not so great—sufficient, however, to cause the management to talk of strapping all curves.

In regard to wear of yard engine driver flanges, it is evident that in running backward the driver flange takes all the lateral pressure directly, without the powerful aid of the forward truck and its long leverage; and moguls and consolidations with the short leverage are necessarily more destructive to curved track than ordinary styles.

As for the consequences of this view of truck-wheel friction, if the disease has been properly diagnosed, the doctors may treat it; if not, no great harm has been done, for errors will be pointed out.

It is evident, however, that Heuck (page 91, 23d line from top) should read, "difficulty would not vanish," etc.; that coning wheels may even increase the evil, and that a greater superelevation of outer rail on a widened gauge may not only be safe but justifiable; also this superelevation might be safely carried down for 150 ft. or more on tangent, thus avoiding the violent upward side throw generally given; my practice has been 20 ft. per degree.

This view also increases considerably the strains in floor and lateral brace systems in bridges and trestles, which had heretofore been covered by our "imperfection factor, or factor of safety."

[The facts adduced above confirm exactly the view which on several recent occasions has been advanced in these columns, that the question of super-elevation has to deal with other and far greater forces than the centrifugal force, so that the precise amount which

it is proper to give is not even indicated by computations as to centrifugal force, which not only Heuck but a great number of more recent writers of field-books and other engineers have made up on the subject. It is surprising how generally it has been taken for granted that a low super-elevation must be the proper thing, because the centrifugal force does not require a high one. It may or may not be true that a high super-elevation is objectionable, but there are no existing experimental facts tending to prove it, so far as we know, and the theoretical reasons seem to be all in favor of it, when once the delusion has been overcome that the centrifugal force is the only one to be considered.

Certain points advanced in this letter seem doubtful, viz.: (1) It is probable that the driving-wheel base on a curve turns around some point near its centre and not around a rear wheel, that being the mode in which the aggregate slippage will be least. (2) The beneficial effect of the "indraft" on a curve applies only to 4-wheel cars to its full extent and will be one-half less with trucks, and it is so trifling a force at best as to be hardly worth considering, and (3) the gauge is not necessarily "perfectly free" for car trucks, because the gauge is wide enough to pass the engine, if by "perfectly free" is meant that there is no binding action of the flanges except such as is required to cause the truck to curve. The best modern practice seems to tend in the direction of giving little or no widening to the gauge, and good reasons can be advanced for this practice.—EDITOR RAILROAD GAZETTE.]

The Education of Locomotive Engineers.

At the recent convention of the Master Mechanics' Association, the following report was presented by the committee on this subject, consisting of Messrs. John H. Flynn, J. N. Lauder and C. K. Domville:

Considering this subject of vital importance to the Association and to the public in general, and that proper care and attention have not been given to it in the past, the Committee have spared no pains to get all the information they possibly could on this subject, knowing and feeling that men selected to fill the responsible position of locomotive engineers must possess facilities that, as a general rule do not belong to all the human race; and as locomotive engineers have to be selected from the ranks of firemen, they feel that due care and caution should be exercised in selecting young men for firemen. Now, to arrive at a proper conclusion—one that would be satisfactory to the Association and to the railroads of the country—your Committee sent circulars to all the Master Mechanics in the United States, Canada and Mexico. We sent out 532 circulars, to which we received 76 replies, being on an average of one answer to every seven sent. Many of these replies contain very valuable information; and were from many of the leading roads of this country, Canada and Mexico. Your Committee beg leave to return thanks for the answers to their circular.

The opinions given us by the different master mechanics who replied were as follows: Five recommended that none but machinists should be locomotive engineers; 19 thought nothing more was needed than to have a young man fire from three to four years with good competent engineers to make him a good runner; 52 thought that one year in the shop and round-house, with two or three years' firing, was necessary to make a competent engineer; many recommended that young men, while firing, read and study books that would give them a general knowledge of the locomotive, such as "Forney's Catechism of the Locomotive," and several other works of that kind. Many of the replies admitted that machinists would make the best runners if they would consent to fire one year after having learned their trade, as they would then have the advantage of knowing all about the construction of the locomotive. Of course, when speaking of that class of men, they meant bright, intelligent young machinists—men with nerve and energy, and quick to act in cases of emergency. Of course, there are some who would never make engineers, no matter what opportunities were given them. If young men of this kind would consent to run one year or more as firemen, we could select our locomotive engineers from among that class; but they will not do it, from the belief that they are just as competent to run a locomotive as the best engineer on the road for which they are working, and if they are given an opportunity to run an engine they are certain to make a failure.

This being the fact, we are compelled to select our engineers from among the ranks of the firemen, as the best and safest runners. Now, this being the class of men from which we have to select our engineers, some uniform mode of instructing them for the responsible position that many of them will have to fill in the future will have to be adopted by the different railroads in America. Your Committee would therefore recommend the following:

All Master Mechanics should have full control of the engineers and firemen in the employ of their respective roads, with full power to hire and discharge the same—of course, recognizing the rights that the General Managers or Superintendents have to order the discharge of any engineer or fireman for neglect of duty.

1. The qualifications for the position of fireman on all the railroads in America should be as follows: The applicant should be from 18 to 24 years old, able-bodied and in good health, with a good common-school education and a fair knowledge of arithmetic, and of sober and steady habits. All applicants should be required to make application in their own handwriting, signing it in the presence of the Master Mechanic or the person he may appoint to hire that class of men. In selecting men for firemen, great care should be exercised. The Master Mechanic should endeavor, so far as lies in his power, to select energetic, smart and active young men—men of nerve and presence of mind, quick to act in cases of emergency which may occur in the position they may be selected to fill in the future. If we select men of that kind, there will be very little difficulty in educating them up to the proper standard to fill the place of engineers.

2. There should be three grades of firemen, classed as Junior, Intermediate and Senior Firemen—the young man just commencing to be classed as Junior Fireman, and so on up to Senior Fireman; the Senior Fireman receiving the highest pay for his services, the others in proportion. When a

fireman has fired four years and is worthy of promotion and fully competent to run a locomotive, there may be no vacancies in the engineer force on the road by which he may be employed. In that case we recommend that he receive a small amount more per day than the Senior Fireman (say from 15 to 20 cents per day more), and be ranked as Veteran Fireman. On the road which one of your Committee represents in this Convention this custom has been in vogue for a number of years, and has worked exceedingly well. All the engineers on this road have been educated under this rule, and to-day no engineers in the country rank higher than they do.

Proper care should be taken in selecting young men for firemen as to their ability to distinguish colors in a practicable, common-sense way. We recommend that all railroads having a sufficient number of employees to justify them in so doing, have a reading-room and library for their firemen and engineers, in which the other employees could participate. The library, to some extent, should consist of works on the locomotive engine that a man with fair education could understand. While we do not think it is essentially necessary, still we believe it would be beneficial to some extent to let firemen work one year out of the four in the shop and round-house, so that they might obtain a more perfect knowledge of all the parts of the locomotive.

Young men consisting of the class we have mentioned are certain to make good runners, and there will be no difficulty, at the proper time, to select good junior engineers from among that class of men. All opportunities possible should be given firemen to get such knowledge of the theory and movements of the different parts of the locomotive as would be beneficial to them when they enter on their career as engineers. To accomplish this end, monthly

journal on which the rollers run, passes through this link. The lower end of the link is tightly secured to the under side of *G* by a key or pin. The upper end of the link forms a spindle on which the roller *J* revolves. The roller *J* plays between the bars *H*, and its upper end is provided with a flange having a greater diameter than the width of the space between the bars, so as to form a head or limit for the downward movement of the end of the bolster. This roller is held in place by the nut *L*, on the upper end of the spindle *c*, and it is placed in such position that the roller *J* may have a short movement up and down on its spindle, so as to prevent the connection between the end of the bolster and the bars *H* from being rigid, and for giving the necessary vertical play required in turning curves. The limit of the vertical movement of the rollers *J* is adjusted to any desired position by the nut *L*.

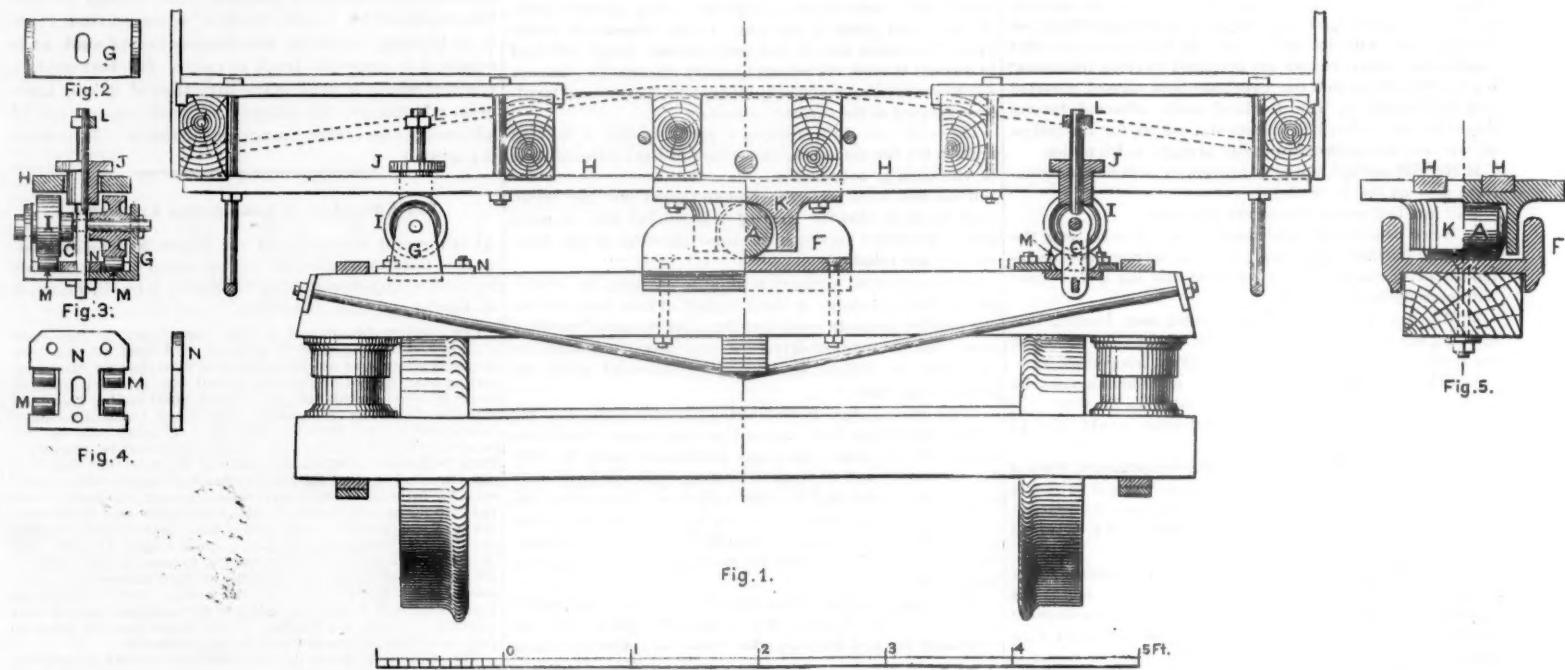
The plate *G* is provided with small rollers *M*, upon which the wheels *I* rest, so as to relieve their centre pivots from any strain that might otherwise bend or break them; and, as the wheels *I* are pivoted, it is not necessary to fasten the rollers *M* other than by placing them in depressions *M'*, fig. 4.

The plate *K*, on its under surface, is provided with a boss, which fits against the side flanges of the plate *F*. This plate is firmly secured to the platform or bottom timbers, so that the truck is held in place while the car is being moved. The

its difficulties and advantages was presented. While the advantages were fully acknowledged and appreciated, some changes in detail were proposed and discussed. Unable to arrive at definite conclusions, we deferred the matter to a meeting in May. New articles were then agreed to by 17 important roads interested. These agreements were to cover pools between interior points and the seaboard, pools between differential fare points (so called), and pools of the business between the seaboard and points beyond Chicago and St. Louis.

After nine or ten days spent in exhaustive discussion of these matters exclusively, it is presumed that these agreements represent the judgment of the companies interested, as well as anything which can now be devised. But it has become more and more apparent that, until two or three important roads not now in the Committee shall join in its effort to secure a division of traffic and earnings, and thereby insure the maintenance of established fares, the present system will lose much of its vitality, and to an extent fail of success. Neither the Chicago & Grand Trunk, the Grand Trunk, the West Shore, the Delaware, Lackawanna & Western, nor the Chicago & Atlantic have as yet become interested in the division, and it is becoming each month more apparent that the time is approaching when no pooling arrangement on business between common points can be maintained by your roads, unless all the important through lines join in the arrangement.

Having reference to this, you decided to continue the existing contracts until the 1st of July, if found necessary to have more time in order to secure the concurrence of some or all of these outside roads. I am pleased to advise you that the manager of the Grand Trunk system has decided, under certain conditions, to enter the passenger pool and become a



FINLAY'S CENTRAL-SUPPORT CAR TRUCK.

lectures might be given in the reading-room by men of good practical common sense, who fully understand what they are talking about. If possible, these lectures should be given by one of the engineers. The firemen would learn more from him, as they would better understand what he was saying, he having formerly been one of them.

Your Committee is convinced that if the mode recommended by them is adopted generally throughout the country that, if not all, a large majority of the firemen would be educated to a point from which there would be no difficulty in selecting men who will make good and reliable engineers.

3. The fireman now being competent to run a locomotive, and being placed in charge of one, has yet some few things to learn that he did not have the opportunity of learning, from the fact that he was not running the engine. While he may run carefully and avoid accidents, he has to learn to run his engine with economy in the consumption of fuel and the cost of repairs. To learn this, and to give the young engineer an opportunity to become a first-class man in his occupation, we recommend there be three grades of engineers—first, second and third grades—and that the remuneration they receive be according to grade; the fireman just promoted ranking in the third grade after one year's service he enters the second grade; when two years have passed he enters the first grade, and becomes a first-class locomotive engineer.

Your Committee is confident that if the different railroads in the country will pursue the mode and manner laid down in this report, there will be no further difficulty in selecting good and faithful men to fill the responsible position of engineer.

Finlay's Central Car Truck

We illustrate a form of central support car truck, patented by Mr. L. Finlay, of Malvern, Ark. The weight of the car rests on rollers bearing on the bolster of the truck. A casting, *K*, is bolted to the transom of the car and works freely between flanges on the casting *F*, which is bolted to the centre of the truck bolster. The weight of the car is taken by a roller *A*, which runs on the casting *F*, the roller path being sufficiently long to provide for the lateral motion of the truck on curves.

The car transom is stiffened by parallel wrought iron bars *H*, *H*, with a space between them. Beneath these cross bars, and at the ends of the bolster, are placed the rollers *I*, which are journalled in the plates *G*, which are provided with suitable side ears for the journals. A flat link *C* is placed between each pair of rollers *I*, *I*, and the

lower end of the boss is provided with a groove, in which the roller *A* is placed.

The side supports of the car work upon friction rollers, *M*, held in position by the plate *N* (see figs. 3 and 4). This plate *N* can be stamped out under a steam hammer.

The intermediate or central support truck has a free lateral motion under the car while carrying the greater portion of the weight of the car, and the vertical rollers *J* operate between the bars *H*, keeping the truck in a true position either on curves or straight track, and at the same time permit the car body to rise above the rollers *I* to the extent of the adjusted distance, thereby preventing rigidity between the truck and the car body, and permitting them to adjust themselves to each other in rounding curves or running on uneven track, and giving this supplemental truck an easy, rolling, lateral motion. Ordinarily one of these supplemental trucks will be sufficient, placed midway between the end trucks.

Some cars fitted with this truck are running on the Hot Springs Railroad in Arkansas. The maximum grades on this 3-ft. 6-in. gauge line are 180 ft. to the mile, and the sharpest curves are 24 degrees, or only 239 ft. radius. The box cars are 34 ft. long by 8 ft. wide outside, weigh 12,000 lbs., and carry from 32,000 lbs. to 48,000 lbs., and have been in use for about 15 months without costing one cent for repairs. A larger size of car, 36 ft. by 8 ft., has since been built by the Barney & Smith Manufacturing Co., and also gives good results.

A model of this car was exhibited at the recent convention of the Master Car Builders' Association at Saratoga.

Address to the Passenger Department of the Joint Executive Committee.

At the meeting held June 19 and 20, Mr. S. F. Pierson, the Vice-Chairman, made the following address:

GENTLEMEN: The contract for division of passenger traffic and earnings, in effect Sept. 1, 1883, has been extended from time to time until the end of the present month, when, unless some further action is taken, it will expire by limitation.

On the 22d of April we held a meeting with reference to completing new pools and renewing the contract for the ones already in existence; at which time the general subject with

party to the division of traffic and earnings between competitive points in which his lines are interested. This decision was not communicated until a very recent date, and the statistics are now being prepared with reference to an adjustment of proportions.

Neither the West Shore nor the Lackawanna has as yet signified any definite policy regarding the matter, and you are left to consider what you will do in case these companies do not come into the arrangement.

As soon as you decide that the new contract shall take effect, the next important business will be the awarding of proportions to the several roads in the new pools, and such revision as may prove to be necessary in the proportions of pools already existing.

In this connection your attention is called to the business to and from points beyond St. Louis and Chicago, known in your chart of forms as Pools 13 supplementary and 14, for the years 1882 and 1883; the statistics of which present some interesting features. (See statements 83, 84, 85 and 86.)

On west-bound business, first-class, the earnings in pools from New York to Chicago and St. Louis for the year 1883 amounted to \$668,596. The earnings of the roads east of St. Louis and Chicago, from first-class business going beyond those points, amounted during the same time to \$280,782, or 29½ per cent. of the total. This amount of earnings distributed among all your roads, involves but a comparatively small sum to each, yet there are important reasons why it should be divided under the rules like the earnings from other competitive business. The currents of business during the first 18 months of these years present few variations, and the relative importance of Chicago and St. Louis as distributing points in Pool 14 (which includes business to Omaha and Council Bluff) appears to have been reasonably well established during that period.

The Earnings Statement No. 86 (Pool 14), the business of the years 1882 and 1883 has been divided into four periods of six months each. In the first of these periods the earnings of roads east of Chicago from first-class business is 56 per cent. of the whole. In the second period it is nearly 61 per cent., and in the third period 62 per cent., while in the last six months it is more than 68 per cent. That the proportion of the Chicago lines should be greater than that of the St. Louis lines in this particular pool is readily understood when we consider the geographical relation of the two cities. But that the proportion of the Chicago roads should apparently increase at the expense of the St. Louis roads leads us to look further. Comparing the business to St. Louis with that to points beyond via St. Louis, we find the former to be 75 per cent. in 1882, and 73 per cent. in 1883. But the business to Chicago, compared with that to points beyond, shows, for the same periods respectively, that the former has decreased from 85.63 per cent. in the first year to 80.61 per cent. in 1883, and to only 77 per cent. in

the last six months of that year. Still further, the total passengers from New York to Chicago in 1882 were 31,435 and in 1883 but 28,750, a loss of 2,685 passengers; while to all points beyond (Pools 13 supplementary and 14) there were 8,419 in 1882, and in the following year 10,729, a gain of 2,310. The total number of passengers from New York to St. Louis was 8,128 in 1882, and 6,908 in 1883, a loss in the latter year of 1,220 passengers. To points beyond, via St. Louis, there were carried in 1882 2,707 passengers, and in the following year 2,553, a loss of 154. From New York to Chicago and beyond there is a net loss in 1883 of 375 passengers, while the gain in passengers to points beyond is, as stated above, 2,310. This gain in traffic to points beyond is to some extent made at the expense of the regular business to Chicago proper, which shows a loss for the corresponding time. Now, if we suppose a relative loss to points beyond St. Louis, as compared with the loss of business to that point, to be the normal relation of the two sorts of business, and apply it to the business to and beyond Chicago, we may be able to form an opinion whether any of the business reported to points beyond Chicago is to be left out of the account in fixing the relative proportion of Chicago and St. Louis business in Pool 14. The loss of business to points beyond St. Louis is 11 per cent. of the total loss to St. Louis and beyond. Eleven per cent. of the loss on Chicago and beyond, 375 passengers, is 42 passengers. Instead of a loss of 42 passengers, however, we find the business to points beyond Chicago has increased 2,310, making by this estimate, 2,352 passengers more than its proportion would be on the St. Louis basis. A reference to Route Statement No. 85 shows that much of this increase occurred in the last six months of 1883, and, taken in connection with the falling off in Chicago business proper, and with what we know of the methods adopted by the brokers at that time, we are confirmed in the conclusion that a considerable portion of the increase was at the expense of the Chicago pooled business, and should have been done on Chicago tickets rather than tickets to points beyond. In addition to this there is reason to believe that the unusually large commissions paid by lines west of Chicago, which were not met by the lines west of St. Louis, diverted an undue proportion of legitimate business to common points beyond St. Louis and Chicago in favor of the Chicago routes.

It appears that the completion of Pools 13 supplementary and 14 is essential to protect the differential-fare pools. While the amount of this business is shown to be less than one-third of the total business, we are still confronted with the certainty that much of it belongs to the business between differential-fare points proper, and ought to be divided as such. It is not now accounted for, because it is ticketed upon a fictitious basis. If the same door is left open which permitted one or two thousand Chicago passengers, in 1883, to be transported on tickets reading to points beyond Chicago, thus avoiding the pool division altogether, is it not a question whether in time the whole business to St. Louis as well as Chicago might not be carried on similar tickets with a similar result? Still further, it does not always occur that stations outside of our territory will be equally well equipped with through tickets to pool points in our territory, and that passengers by one route will purchase tickets to the nearest gateway and book through from there, while by another route they would be able to book through from the initial station direct. For example: If from Elgin, Illinois, there are through tickets to New York by one line east of Chicago and none by another, and if the business both to and through Chicago is divided on the same per cents., it would be a matter of indifference to either line east of Chicago in which pool the tickets were accounted for, since its interest would be the same in either case. But if in one case it is divided and in the other it is not, the situation is changed, as regards the lines east of Chicago. Considering this, and the likeness which exists between the proportions of the business during the 18 months referred to as it has actually divided itself, and the awards made in the differential-fare pools, I have no doubt that an equitable division of the whole business could be made by establishing fixed proportions for Chicago, St. Louis, and intermediate points respectively, and giving all that which is to pass through Chicago the Chicago Division, all that through St. Louis, the St. Louis Division, and leaving the small per cent. which passes through intermediate points to take on the division actually shown in the same period.

A statement (No. 100) copy of which will be furnished you, shows the distribution of the business from New York and Boston to St. Louis and Chicago and points beyond, upon a basis like that described, and to that statement your attention is respectfully directed.

THE CERTIFICATE PLAN FOR RETURN PASSAGE AT REDUCED FARES.

The applications for reduced fares in the territory of the Joint Executive Committee for the accommodation of conventions of religious, scientific, political and benevolent societies, always numerous, have received during the present season more favorable consideration than has been heretofore possible. The commerce in passage tickets has been conducted heretofore with so little restraint that it has been a serious problem how particular convocations could be accommodated with special low fares which would not be traded upon by middle-men and made to accommodate a large proportion of the traveling public, for whom they were not intended and who were not entitled to enjoy the special privileges. The certificate plan, which was adopted by you early in the season, and which was intended to cover a considerable proportion of the cases referred to, has been put in operation, and has been so far successful as to encourage the belief that it will be found the best plan yet devised for most of the special fare occasions. I respectfully recommend that you adopt, not only for the through business between distant points, but also in your local business, so far as it is found to be adapted, the form of certificate agreed upon by the Committee, in order that your agents, as well as the public, may become familiar with it.

There are a number of applications for reduced fares which require attention, and their adjustment will constitute part of the business of this meeting.

PACIFIC COAST AGREEMENT.

Considerable difficulty appears to have grown up on the Pacific Coast. It is not new, but is simply a prolongation of the old difficulty growing out of commissions and various other irregular practices which are participated in by the agents of these lines and of other lines running in connection with them. It would seem as if the city of San Francisco is in a peculiarly favorable situation, from a railroad point of view, and that there ought to be no difficulty in securing the business from that point at a minimum expense. The present agreement may be capable of improvement, and I respectfully recommend that it be continued in effect, with such revision of it as may be necessary.

At the time the California agreement was adopted, it was deemed advisable, on account of the remoteness of the situation, to have a referee who should hear and decide cases arising under it. In accordance with this understanding, Mr. George W. Ristine was appointed referee, and accepted the position. In pursuance of his duty he has heard, decided and reported his decision to me in 18 cases. Fines have been assessed in five of these, and he decides that in

the other eight cases the charges were not in all respects sustained. In order to give the principals reasonable time in which to become familiar with the details of these cases, the drafts for fines have been delayed, but it is expected that they will be made in accordance with the decision of the referee.

CERTIFIED COPIES OF REPORTS OF INTERCHANGE BUSINESS.

One of the difficulties with which the office of the Chairman is confronted is that of securing such a full history of all the business as is necessary, not only for the purpose of check, but also for the decision of subsidiary questions frequently arising. I have decided to ask you, from a time to be agreed upon, to furnish this office with verbatim copies of all reports of business to and from other roads. This work any ordinary copyist can perform, and it will relieve the audit offices of the necessity for expert help in making a constantly increasing and difficult compilation which is now required, and will furnish this office with a more complete check on the business.

These reports would be sent under the certificate of the respective auditors or comptrollers of the various roads, and would avoid the necessity for that troublesome inquisition so annoying to you and perplexing to me.

The complaints for irregularities have not been so numerous as heretofore, and I can only express the hope that when more competitive business is pooled and each company is assured of its proper proportion, you will be relieved to a great extent of the anxiety which hitherto in some cases may have led you to undue suspicion and retaliation for imaginary grievances.

NEW CONTRACTS.

After an exhaustive discussion of the subject it was not considered advisable to put the new agreements in effect

per cent. advantage in time over the ordinary lathe with unquestionable advantage in uniformity. Seven report using only slide lathe and bolt cutter.

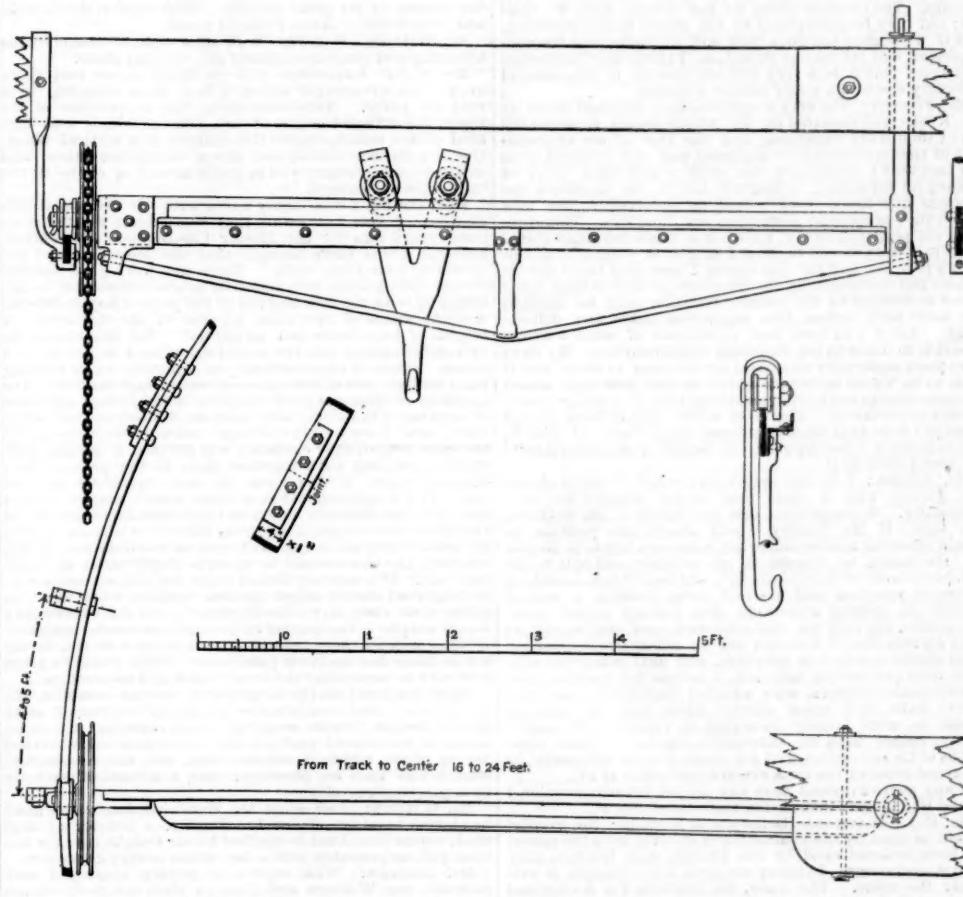
Eleven report using grindstone and emery wheels to a considerable extent, some doing all finishing that way. Mr. Sprague reports that he does all roughing for finish, and all finishing of steel and iron forgings, brass and iron castings and brass and copper pipes on grindstones, solid and covered emery wheels, emery belts and rollers, + and considers it a great saving in files, machinery and labor, doing all this class of work as well, and much of it better than by the more expensive processes.

Mr. James Sedgeley (Lake Shore & Michigan Southern) reports using the Harts flue welding machine, which does the work better and cheaper than it can be done by hand. Mr. J. S. Graham, of the same road, uses the same machine, with a saving of 20 per cent. Mr. George Hackney (Atchison, Topeka & Santa Fe) also reports in its favor. Mr. L. C. Noble is using Charlton's hand machine for welding flues, two men welding 75 flues in a day.

Mr. Geo. F. Morse (Portland Locomotive Works) cleans flues by slinging them in two endless chains suspended on revolving pulleys, applying sand and water and allowing the flues to grind together by the motion of the chains. Most members report using cleaning barrels.

Most members report using dies and formers in smith's shop. Mr. Allen Cooke (Paterson) uses spring dies under steam hammer, saving time and help and producing more uniform work. Mr. Sprague uses spring dies and formers under steam hammer for most shapes. The heads of all motion pins are formed in steel dies counter bored for head, cutting off material previously to accurate length, saving iron and considerable lathe work, as the heads are formed concentric and of uniform thickness.

Mr. Sprague reports use of shop cranes, + and prefers a screw



SHOP CRANE IN USE BY H. K. PORTER & CO., PITTSBURGH.

until other lines not parties to the existing contracts shall be ready to join in the division of traffic and earnings. It was therefore agreed to continue the existing contracts in force until Aug. 1, 1884, by which time it was hoped the statistics would be ready, and no further obstacle would prevent a complete arrangement, and an adjournment was made until the next meeting, to be held about July 15, at the call of the Chairman.

Shop Tools and Machinery.

At the Convention of the Master Mechanics' Association, held at Long Branch, the committee appointed to report on Shop Tools and Machinery presented its report. Some time ago the committee addressed a circular to members and tool-makers, making inquiries as to the use of milling machines; special machines for making and threading bolts, set screws and studs; finishing work by grindstones, emery wheels or belts; special tools for scarfing or welding tubes; use of dies and formers in smiths' shop; and made inquiries as to any special tools or improved machinery for general production not in general use. The committee, which consisted of Mr. H. N. Sprague (of Messrs. H. K. Porter & Co., Pittsburgh), Mr. John Black (Cincinnati, Hamilton and Dayton) and Mr. J. K. Taylor (Old Colony Railroad), reported that they received only 14 replies from members and some from tool-builders. Nine reported in favor of extending the use of the milling machine on locomotive work. The Brown & Sharpe Manufacturing Co. says that it is extending the use of milling machines in its own works, and finds that in most instances the work is performed more quickly and with greater uniformity, leaving the parts much smoother, saving time in finishing. Mr. Sprague has milled all rod brasses for many years*, and can do as much on one plain milling machine as on two planers, with cheaper help, the work being more accurate and more easily fitted to strap.

Six members report that they use turret-head lathes or stud machine for making small pins and making and threading all studs, set-screws and tap bolts, and claim 30 to 50

hoists to chain blocks for lifting or lowering work. An illustration of a type of shop crane used for many years by H. K. Porter & Co. is annexed.

In conclusion, the committee recommends the use of a stud machine in all shops having sufficient work of a kind suitable for such a tool, and that in order to secure uniformity all bolts, studs and set screws be cut or finished in dies. The committee also recommends grindstones, emery wheels and belts for roughing and polishing, on the ground of economy; and believes that the best results can be obtained from milling machines when used in large shops working on duplicate parts.

Automatic Freight Car Couplers.

The following is an abstract of the discussion that took place on this subject at the recent Master Car-Builders' Convention. The report of the committee will be found on page 458 in the issue of the *Railroad Gazette* for June 20, 1884:

The report of the committee having been read, Mr. J. W. MARDEN (Fitchburg) said that many members here expected the committee would recommend some one or two draw-bars for adoption by this Convention. After long consultation we found that it was impossible to report to this convention any one or two draw-bars to be recommended for adoption, and we concluded to lay the whole subject before the Convention, and leave to them the discussion of the merits and defects of the different draw-bars.

Mr. SANFORD KEELEB (Flint & Pere Marquette) was aware of the difficulties attending a choice, and suggested that this Association hire a commission of experts capable of managing tests, and that the car-builders give facilities for making such a test by putting them on the cars. The inventors would supply the couplings and the commission could report at a special meeting some time this fall, and, if necessary, have the very kind of draw-bars there, where all can witness a test. It would be productive of better re-

* See *Railroad Gazette* for May 30, 1884, page 417.

+ See *Railroad Gazette* for May 30, 1884, page 416.

suits than to adopt from the model or explanations given by an inventor. He would suggest the name of M. N. Forney as the practical man to be on the committee. It requires somebody who can devote more time to the subject than any of the car-builders can.

Mt. F. D. ADAMS (Boston & Albany): The committee found it very difficult to agree upon any one or two couplers. We realized very fully the necessity of a very early decision or some recommendation of this Association on account of the pressure that is being brought to bear on the railroads by the state legislatures. The Massachusetts and some other railroad commissions are looking to this Convention for a specific report. They expect that we would select from the multiplicity of patterns some that we consider meritorious, and present them to the railroads. They do not expect us to select one; they would not select one; but they expect us to manifest by some act some limited number that we would be willing to accept as standards for our different roads. We could only do that by appointing a commission or an expert for the purpose of continuing these trials. We suggest individually that Mr. Forney be appointed by this Convention as our expert to attend the examinations and hearings of all of the railroad commissioners that have been appointed or will be appointed within limited time, and also any trials or examination that may be thought best by the Executive Committee of this Association; and if the Executive Committee should see fit to order any trials, that Mr. Forney would attend them; with his knowledge of mechanics and of the manner of conducting tests, that there was no man among us that was so well suited for it, and so capable of doing it; and consequently we urged that he be appointed for that purpose, and in that way we conceived that we might get at some definite fact in a very reasonable time. This matter is as important as anything before us at this meeting, as the law is pressing us very hard, and we cannot put it off very far. They will compel us to do something, or take the matter out of our hands, where it really belongs. The commissioners do not dictate what we shall use; but they feel compelled by the public to do something, and if we neglect our duty they will do theirs, and the consequences will fall on our shoulders. I think the Convention will agree that it is a very difficult matter to recommend definitely one of the many similar couplers.

Mr. FORNEY: The very complimentary proposal made by Mr. Keeler and repeated by Mr. Adams makes it necessary that I should say something, and the fact of my appreciation of that compliment is increased and not lessened from the fact that I appreciate the work which they think of placing on my hands. I doubt if any of the members appreciate how much work would be involved in the task which they propose to place upon my shoulders. Therefore I am not prepared to say, before it is more definitely stated what that duty would be, that I should be willing to accept such a position, and for this reason I hope that there will be a more full discussion by the members present so that their views in relation to the coupler question may be brought out more fully before this suggestion takes any definite shape. All of you have had experience of what a weariness it is to listen to the inventors of car-couplers. My days have been materially shortened by listening to them, and if I am to be placed before the public as the person to whom all these cranks are to address themselves, it is really a very serious undertaking. Therefore before any definite motion is made I hope that all will present their views at length, and determine what we are to do before you undertake to say that I shall do it.

Mr. ADAMS: I should regret very much if we burdened Mr. Forney with a care that would shorten his days materially. We appreciate him too highly to do anything like that. If Mr. Forney would accept this position he would have the matter somewhat in his own hands to dispose of. He might be present as an assistant and help to the railroad commissioners in the fail, and assist them in making a proper selection and prevent them making a serious mistake in getting something that nobody would want. The public, the railroad commissioners, and our legislators have an idea that if we could get an automatic coupler nobody would get hurt on railroads, and that whenever anybody does get hurt by railroads, it is done by coupling cars. If automatic couplers were adopted universally, our cars would have very much shorter lives; and our expenses would be very largely increased in repairs. We need a safety, rather than an automatic, coupler. About nineteen-tenths of these couplers that are claimed to be automatic, in the strict sense of the term are not automatic at all.

If any parties present have any special favorite coupler, I should like to hear them make their claims for it.

Mr. R. C. BLACKALL (Delaware & Hudson): No coupler should be tried by the committee of experts until the patent has been declared valid by the Eastern and Western Railroad Associations. In many couplers the principle is certainly the same. The Ames, the Mitchell, the Archer and another coupler are very similar.

Mr. F. M. WILDER (New York, Lake Erie & Western): There are several matters to be considered. The first would be the functions which we expect the car-coupler to perform; whether, besides coupling with itself, it is able to couple with the present system of an ordinary link and pin, and whether it is to couple with other couplers which are supposed to be automatic. The question of cost would largely influence its practical adoption. If the railroads applied the Janney passenger coupling or the Miller hook to all their freight cars, it would probably be a good thing to do, although it would cost \$100 a car.

The question as to what the coupler should perform is influenced by the appliances used in connection with the coupler. Making the connection either by hook or by pin between that and the link; handles so as to uncouple from the roof, without going between the cars; whether the man who couples should guide the link in case the car is too low or too high, or whether the coupling itself should hold the link in the right position. Many questions of that kind must be considered. At the trial to-day, many made a coupling at ten miles an hour; but the difference in the cost of those couplers ranged from \$5 to \$15 a car, and all seemed to do the work about the same. This association ought to adopt a coupler that could be applied to cars as economically as possible, and perform the duties expected of it.

Mr. E. B. WALL (Pittsburgh, Cincinnati & St. Louis, and Chicago, St. Louis & Pittsburgh): We should adopt something in this matter, or else own up that we cannot. There are a certain number of confusing questions that surround the matter of couplings, but we can now decide on a certain number of principles which any coupling should fulfill. If we decide on those principles, then they will be known as the opinion of the Association, and inventors who take the question up can see what conditions they must fulfill when they invent a coupler; and those who have invented couplers which do not fulfill those conditions will be discouraged. In order to bring this matter to an issue before this meeting I move "That it is the sense of this Convention that any automatic coupling presented here should couple in a vertical plane;" by that I mean it should be able to slide up and down. All couplings which contribute the weight of one car to another car, are objectionable, and if we settle on that principle, we will also have the advantage of a car having a considerable lateral motion.

After we determine whether this is a good principle, we can go on to some of the other principles, and if we do adopt this suggestion of Mr. Keeler, that a committee of experts be appointed, they will have certain points given them in making their judgment.

Mr. KEELER: I would add to that, shall couple automatically with a link in one of the old-fashioned draw-bars.

Mr. ADAMS: Some few years ago we decided by a unanimous vote that any coupler presented here for adoption by this Convention should be without pin or link. I believe that we want an automatic coupling that will couple under all circumstances alluded to by Mr. Wall and Mr. Keeler.

Mr. WALL: Does Mr. Keeler mean that any coupler we shall adopt shall couple automatically with the old style link and pin? If my motion about the vertical plane is carried, it will necessarily dispose of the link and pin, because they do not couple in a vertical plane.

Mr. KEELER: There are now in service about eight hundred thousand cars that couple with a link and pin, and it will take a long time to convert those to a hook draw-bar; and the railroad companies throughout the country will not take such a step at present. I am in favor of doing it if it could be done; but many companies in the West will not adopt any such draw-bar; but would take up a draw-bar coupling with a link and pin.

Mr. WALL: I believe in a coupler that will couple with a link and pin. Mr. Keeler means couple—not couple automatically.

Mr. KEELER: Couple.

Mr. WALL: Then I accept your amendment.

Mr. WILDER: If we pass that resolution, we should probably have to adopt the Janney, or some coupler of that kind.

Mr. WALL: I have to take exception to what Mr. Wilder says. There are several couplers of that kind, and if this resolution is passed, it is probable that many others will be presented. The Miller coupler on that principle, and that is one reason of its great success. Then there is the Cowell, and others whose names I cannot recall.

Mr. WILDER: Will Mr. Wall state what he considers the advantages of couplers coupling in a vertical plane.

Mr. WALL: Experience with the Miller shows that there are certain advantages which follow from coupling in a vertical plane. Notwithstanding the inequalities of the track, the different height of cars, you can couple with any kind of cars with a coupler that couples in a vertical plane. One coupler can slide up and down within the other, and still remain in contact, and in going around a curve it has important advantages.

Mr. CLOUD: I thoroughly agree with Mr. Adams in this matter. I was not aware that this subject was taken up some years ago by the Master Car-Builders' Convention, and that it was there thought that the loose link and pin should be done away with. There are very good reasons for our taking some such action as is now before the house. Coupling with the link and pin of the present day is difficult in many cases of operation because of the differences in heights of draw-heads and on curves. The link cannot be driven far enough into the second draw-head to get the pin down. There is often difficulty in coupling where nothing but a straight bar of iron passes down through the link. The majority of these patented couplers which either use loose or stationary links have the draw-head filled up, and while they couple very well in a straight track, or with cars about the same height, they certainly will get into a greater difficulty in coupling cars together than at the present day, because there is less room in the draw-head for the link. If a coupler should be adopted which couples with a loose link the difficulty would be very much increased by the fact of all such couplers requiring links of a certain length, the cars would not couple with most of the links used in this country, and there would be all sorts of difficulties in coupling cars. If a railroad should adopt one coupler and a connecting road should adopt another coupler, what are you going to do when they come together? I do not believe they would couple. The matter of patents is so much involved. In some patents there are not more than two words in the whole thing that makes it patentable. There would be great difficulty in unraveling the rival claims and ownerships.

There is a great deal to be gained if we can establish the one principle that a satisfactory automatic coupler or satisfactory freight coupler or safety coupler, whether it is automatic or not, should perform the coupling along a vertical line or plane, which is substantially, but not necessarily, what is now used on passenger cars, as several others have been proposed recently.

Mr. WILDER: If we adopt Mr. Wall's resolution, we shall be obliged to adopt—if not the Janney, a coupler of that kind, which could not be applied to our freight cars for less than \$15, or probably \$25 a car, which is very expensive.

Mr. KEELER: With regard to getting entangled with patents, the Western and Eastern Railroad Associations deal with that entirely. We use nothing that is patented without first having the Western Association pass upon its validity. If a case comes into court, the Association takes care of it in all cases.

Mr. WILDER: The question of deciding upon the validity of the patent in regard to the coupler we are going to adopt is entirely foreign to this question. If a man came in with a coupler which was an infringement of a dozen different patents, if it was the coupler we wanted, I do not think the fact that it might infringe some other patent ought to be decided at all.

Mr. CLOUD: The question Mr. Wilder brought up ought to be looked at in this light; whether the entailed expense of the adoption of something that is not a mechanical success would not reach the original cost of something that would do the work from the start. We are competent to decide what is a proper thing mechanically. If we allow the question of cost to enter too heavily into our considerations and lose sight of the mechanical questions, we will certainly be to blame. If we allow a coupler to go into use as an automatic coupler, and one is put on one series of roads and another on a certain other, and after a while we find that the cars will not couple, it would reflect very seriously upon us.

Mr. ADAMS: Mr. Wilder says that we should have a cheap coupler. Our officers consider the expense a secondary point, safety being the first consideration. The Wilson & Walker coupler furnished its own pin and link, is in use on 100 or 200 cars, and couples ordinarily well. The Ames coupler has been in use continually, to my certain knowledge, on 100 cars for over three years, on 50 for over six years, and never has one of them broken. Take the cost of links and pins as the basis of our expense—about \$9,000 a year for 6,000 cars. On that basis, the 800,000 freight cars in this country cost annually \$1,200,000 for links and pins alone. This sum would go a great way toward supplying couplers. With the Janney or Cowell couplers you must use a link and two pins to couple with the old bar. With the Wilson & Walker, or the Ames, you have got to use one pin. It is more unsafe to couple an old-fashioned car on to a hook than it is upon a square-headed buffer. Everybody knows how unsafe it is for a man to go between cars with a Miller platform and the old-fashioned draw-bar.

Mr. WALL: We would still have the link and pin after we got through with the process, if we got one of the couplers which Mr. Adams evidently prefers. He is willing to grant

that we want to do away with the link and pin, some way, sooner or later. If we select a coupling which is going to take the old link and pin, we have a coupling which you may say is tentative; it is good for a time. Now, if we could get a coupling which would couple satisfactorily with itself, and also couple with the ordinary arrangement, why, then, after a while when we get the standard coupling in use, we will have them all the same. We will do away with these objectionable features.

Mr. ADAMS: If the Wilson & Walker or Ames or Mitchell were adopted, after the old couplings were done away with, we shall not want any links and pins, as they furnish their own link and pin. As soon as the old cars are used up and these are brought into use generally, there will be no links and pins. We have had 50 cars equipped with the coupling I spoke of running three years, and none of the couplings have given out. Mr. Kirby has had 50 cars in service six or seven years, and he has had similar experience.

Mr. MARDEN: In selecting a coupling, we should not consider the links and pins that would have to be used until such contrivances were abolished. We require additional information, and we want to know all the difficulties that come up, and look at it from more than one standpoint.

Mr. WILDER: There can be no perfect draw-bar or self-coupler invented in which the principle proposed in Mr. Wall's resolution is not involved. There are many draw-bars now in use. We have adopted one on the Erie road which is automatic in every respect, but is not as perfect as it should be.

The PRESIDENT: I hope we will have a more general expression of opinion on this matter. It has agitated the state legislatures, and you are the parties who ought to give some advice and express your opinion on the question.

Mr. McILWAIN (Grand Trunk, Great Western Division): If we recommend for adoption a draw-bar coupling with Mr. Wall's motion, links and pins will be eventually done away with. If, however, the coupling generally adopted on freight cars will only couple with passenger cars by using a link and pin, we shall be in a difficult position. I am in favor of the vertical plane rule, though it would be difficult to do away with link and pin entirely.

Mr. MCKENZIE: Mr. Wall's motion does not confine us to the hook, but a link might possibly be constructed to do the same thing. I do not see why a link cannot be raised and lowered just as well as a hook.

Mr. C. A. SMITH (Union Tank Line): There are probably very few railroads in the country that are not putting on safe couplers of some kind, and it will be much more difficult some years hence to bring about the adoption of a standard coupler. We ought to do it ourselves before the lobbyists get hold of it.

Mr. ROBERT MILLER (Michigan Central): The Ames or Wilson-Walker would do away with links and pins, and certainly the record of those couplings has been good, especially of the Ames and that class of couplers, and I should favor Mr. Wall's suggestion in regard to that. I favor the proposition of appointing Mr. Forney. If he needs any assistance, give him power to select from the members of this Association, or any expert in the United States.

Mr. HITCHCOOK (Connecticut River): The laws of Massachusetts require that we shall put on such automatic coupler as the Railroad Commissioners accept. Suppose if the Convention decide upon a coupler, and the Railroad Commissioners of Massachusetts should approve a different coupler, what would you do about it?

Mr. ADAMS: There is no possible danger of that. The Commissioners have great confidence in this Association; and whatever this Association recommends, I know that the Massachusetts commission will adopt.

The PRESIDENT: No subject pertaining to the mechanical construction of railroad appliances is agitated by the public so much to-day as the question before you. Our legislatures are going to tell us what we must do. Any railroad commission in any state in the Union that since its appointment has made a report, has referred to this subject. Some have stated that the cost should not enter into the conditions at all. One commission says that the large expenditure would be warranted if a safety coupler could be used on all freight cars, and that it would release the railroad companies from a grave responsibility. One of the commissioners of the state of New York has just told me that the complaints made to them daily almost of the injury to men while coupling cars were sickening. He further said: "I have made up my mind that it is not only desirable to have a safety coupler, but it is most assuredly practicable."

There is not a man within the sound of my voice that disagrees with the statement of that commissioner. That being the case, we should not shift this responsibility any more than is actually necessary. I hoped that the committee would recommend only three or four couplers, which in their opinion could all be used, which would couple with one another, and at the same time couple with the old devices. They mention eight. They have not put these down in the regular order of their merit. If we can get down to eight, all coupling with one another, and with the old device, we might then, by experiment, reduce them down to two or three, or one, which would be the inevitable result of the process. We would then be doing what everybody is looking for us to do. We must do something. This dilly-dallying will not answer. If we do not make a selection in another year, there will be more automatic or safety couplers, and the longer we delay this matter the more difficulty there is in arriving at some conclusion. Therefore let us show, by some act of this meeting, to the railroads and to the public, and to the Railroad Commissioners, that we comprehend the difficulties and are ready to meet them. While I am very much in favor of the suggestion made that a commission be appointed, consisting of one—and I do not think we could find a better one than has been suggested if we hunted the world over—it would put this question in a shape that would release him from a great deal of annoyance and trouble, and that by selecting—if we cannot do better—the eight that are here, if these will all couple one with another and with the old devices, and by some suitable resolution placing it before the public as the act of this Association. (Applause.)

Mr. WILDER: I fully agree with Mr. Garey. Our company, appreciating their responsibility toward the public, have adopted the Gifford as a standard automatic coupler. We are making 50 a day, and are applying them to our cars as fast as we can. We have 2,000 cars already equipped. It is not one of the chosen couplers, but is as good as any of them. It will couple with any other coupler using a link and pin. There has been no trouble with it in a year and a half of actual service. I should move that if we are going to adopt a certain number, that the Gifford be placed among them.

Mr. WALL: If we were going to investigate any subject, we would take it up part by part. Now, I want to get the sense of the convention on these principles as we bring them up. Of course if I proposed a motion it is because I believe in it, and I feel that if that motion was defeated it would be equivalent to taking lame man to do hard work. But if it was not concluded that we wanted a lame man I should be as earnest in my support as before, provided it was a man with a crutch. Let none of those whose couplers have existed previous to this date be examined in connection with those which are named. But others coming in afterward,

let them be passed upon, and if meritorious added to the eight.

Mr. ADAMS: Does Mr. Wall's motion commit us to a hook coupling?

Mr. WALL: No; but it will stimulate inventors to make couplings that will involve this principle of coupling on a vertical plane.

Mr. CLOUD understood Mr. Wall's motion to mean that it is the sense of this meeting that the best automatic coupler, mechanically, will be the one which, when it is universally used, will couple without any link.

Mr. WALL: Yes.

Mr. CLOUD: I wish to amend the motion by adding the word "mechanically," and more, "that it is the sense of this convention that the best coupler, mechanically, is one which performs the coupling along a vertical plane; so that after it might be generally introduced there would be no further use of any link." All who are thoroughly familiar with the operation of railroads believe that, mechanically considered, the most satisfactory coupler would be one which would couple along a vertical plane; so that whatever the difference of heights of cars might be, within certain limits, the coupling would be performed. All will admit that it would be a good thing ultimately to abandon the link. But in the process of transition from the present to the proposed practice, the coupler used, whatever it may be, must couple with the old one.

I shall go away from here thoroughly ashamed of myself, as a member of this convention, if we cannot agree upon one mechanical principle that a coupler ought to fulfill. Our people look upon this as a test case of the success of this organization. If we do not this year do something in this matter—I do not mean appoint a commission—that is somewhat shirking a duty—if we cannot pronounce on some principles that should be involved in a self-coupler, we shall be objects of derision. We ought to do more than we ought to point out the principal mechanical features that self-couplers should possess, and go still further, and indicate a little more in detail the features of the successful coupler. Members ought to lay aside all petty feelings. Three, if not four, couplers, which I will not name, come within the scope of this motion.

Mr. WALL accepted Mr. Cloud's amendment.

Mr. WILDER: The correct principle for coupler is embodied in the resolution.

Mr. CLOUD: This motion will simply guide any committee that might be appointed.

The motion was carried unanimously.

Mr. ADAMS: Some of these will couple with each other automatically and many of them will not. The Wilson & Walker will couple with the Ames automatically. The Wilson & Walker and the Ames will couple with the Archer automatically. But to couple with the Cowell you must use the link with a good deal of care; and you would have to use the link with the Ames, and you could not do it automatically. You have to use link between any of them and the Cowell.

Mr. VERBRYCE (Chicago, Rock Island & Pacific): Would it not increase the danger of our men to couple cars equipped with these couplers and with the old link?

Mr. ADAMS: There is a strong probability that a system of lines comprising 100,000 cars will shortly adopt a certain coupler.

Mr. WALL: We wish to influence these lines by the motion we have just passed as to the correct mechanical principle of coupling.

Mr. WILDER: "That it is the sense of this convention that the following draw-bars have been found to couple with draw-bars in common use, and would recommend that they be selected and experimented with by railway companies unless a more perfect coupler can be found. Archer; Ames; Conway-Ball; Cowell; Gifford; Mitchell; United States, and Wilson & Walker." The Janney and the Cowell will not couple automatically with any but themselves. Two Miller hooks will often fail to couple.

Mr. MARDEN: The bar mentioned in the resolution will not couple automatically with the old fashioned draw-bars that have links, and there is no draw-bar among them that will couple automatically with a link, as any old-fashioned mouth draw-bar is liable to have the link thrust around one side so far as to strike the edge of the draw-bar, and it has to be manipulated by the train-man in order to have it couple with any of those couplers. Two Millers, when in repair, will couple together.

Mr. WALL opposed Mr. Wilder's motion as conflicting with the motion passed. The Pennsylvania Railroad were not prepared to adopt any special form of coupling at present. We want a guiding principle to enable us to sift down the various forms of couplers. The Pennsylvania, the Burlington, the Nickel Plate and other large corporations are using couplers which couple on a vertical plane, and might be included in this resolution.

Mr. ADAMS moved to amend Mr. Wilder's motion and reduce the number to four—the Archer, the Ames, the Wilson & Walker and the Cowell.

Mr. WILDER: I move that the Gifford be substituted for the Ames.

Mr. TOWNSEND (Chicago & Alton) moved that the Janney coupler be included in Mr. Adams' motion.

Mr. ADAMS said that the Janney and the Cowell were effective and practical couplers in every way, but are dangerous to life in coupling with the present system.

Mr. MARDEN did not agree with Mr. Adams. Dead-wood blocks would soon be universal, and then a hook coupling would be safe.

Mr. CLOUD moved the substitution of the following resolution for the whole matter:

"Resolved, That this Convention recommend to any railroads who wish to experiment with couplers not belonging to the most mechanically perfect class, as Janney or Cowell, to experiment with the following: Archer, Wilson & Walker, Ames, Conway-Ball, United States, Gifford, Mitchell."

Mr. BLACKALL seconded the resolution, which was carried unanimously.

After some further discussion,

Mr. SOULE (West Shore) moved the adoption of the following:

"Resolved, That the Executive Committee issue a circular to all the railroad companies represented in this Association, setting forth our plan of retaining Mr. F. N. Forney to devise, conduct and record tests of automatic freight-car couplers, and asking them to signify their willingness to sustain their pro-rata portion of all expenses incident to such tests."

This motion was carried unanimously, and the discussion closed.

The Origin of the Delaware, Lackawanna & Western.

The unfortunate Drinker-Cooper tragedy at Montrose, Susquehanna County, which resulted in the death of W. H. Cooper, one of the most prominent citizens of the place, at the hands of Joseph Drinker, the last male descendant of a pioneer family of distinction in Northeastern Pennsylvania, the death of Cooper's aged father from grief, and the hastening of financial disaster through the failure of the bank of which W. H. Cooper was President, which disaster might have been prevented, has recalled, besides the sad history

of Anna Drinker, the gifted poetess, printed in the *Times* a few days ago, a chapter in the history of the early development of this portion of the state, and especially in the Lackawanna Valley, which possesses a more than ordinary interest.

The Drinker family was a prominent old Quaker family of Philadelphia. Henry Drinker became interested soon after the Revolution with Benjamin Rush, George Clymer, Samuel Meredith, Robert Morris, and others in the purchase of Pennsylvania wild lands. This portion of the state was then an entire wilderness, and in 1789-91 Henry Drinker purchased from the state 25,000 acres of land, in what are now the counties of Lackawanna, Wayne, Pike and Susquehanna. A great portion of this land was on the headwaters of the Lehigh River, in the first-named county when it formed a part of Luzerne. It was called Drinker's Beech, because of the forests of beech trees that covered the tract. Drinker cut roads at great expense through these forests and spent large sums in efforts to make the Upper Lehigh navigable in order to make his land available to settlers, but the locality was then too unpromising to attract purchasers. In 1815 Henry W. Drinker, son of Henry Drinker, and grandfather of Joseph Drinker, now in the Montrose jail for the murder of W. H. Cooper, himself made a settlement in the Beech, in what is now Covington township. Through his efforts many settlers took up land, which they obtained for \$5 an acre with long credit, payable in lumber, beech-nuts, work, shingles, or any product, natural or cultivated, of the forest or soil. These settlers were the ancestors of many of the coal and iron kings of the Lackawanna Valley to-day.

To open this isolated settlement to the outside world, and make the region accessible, Henry Drinker built, in 1819, the first turnpike road into the Lackawanna Valley. This he had chartered as the Philadelphia & Great Bend Turnpike. It was 60 miles long, and extended from Stanhope, N. J., to Drinker's Beech. It is known as the "Old Drinker Road" to this day, and is a landmark in fixing boundary lines. In 1819, also, Drinker became aware of the presence of anthracite coal in the valley, and although it was then valueless, all efforts to introduce it having failed up to that time, he believed in its actual importance, and foresaw the advantages of a better communication between the Delaware and Susquehanna valleys. His idea was a railroad, although there was not one in existence in the world at that time, except the crude English mine tramways. Drinker blazed with an ax a route from the mouth of the Lackawanna, now Pittston, through the unbroken forest, across the lofty Pocono Mountains to the Water Gap, a distance of 60 miles, and satisfied himself that such a scheme as he proposed was feasible. In 1826 he obtained a charter from the Pennsylvania Legislature for the Susquehanna Canal & Railroad Co. His idea was a railroad with inclined planes or a canal, horse-power to be used, if a railroad between the planes, and water-power to raise the planes. He interested a number of prominent men in his project, and in 1831 a survey of the route was made.

Anthracite had then asserted its value. The Lehigh Navigation Co., on the south, had opened up a profitable market in Philadelphia, and the Delaware & Hudson Canal Co. had brought the riches of the Upper Lackawanna Valley to light, conquered the prejudices of New York against the new fuel, and was advancing to wealth and power. Coal was selling at \$9 a ton, and coal land in the Lower Lackawanna Valley could be purchased for \$10 an acre. The engineer reported a railroad could be built from the Water Gap to the Lackawanna, 70 miles, for about \$625,000, on which 240,000 tons of coal could be carried a year. The road was to be operated by inclined plane and horse power, as the locomotive was yet an uncertain factor in the railroad transportation problem. At the time Drinker obtained his railroad charter, in 1836, Samuel Meredith made a survey from the Lackawanna Valley to Providence to Great Bend, for a railroad 47 miles up the Susquehanna Valley to the New York State line. A charter for a railroad over this route, known as the Leggett's Gap charter was obtained. The idea of this was to form a junction with the proposed railroad between the Lackawanna and the Delaware, and thus make through route to the rich and growing southern tier of New York.

Drinker's company was organized in 1832, he being elected President. He could not enlist capital in his scheme until 1833, when he obtained a perpetual charter for a gravity railroad from Pittston to the New York state line in conjunction with the first charter, and New York capitalists agreed to aid the enterprise. The Erie Railroad was then being agitated, and the tide of emigration and trade was to the southern tier and the lake country. The route proposed by Drinker was 80 miles shorter from New York city to the southern tier than the Erie route, and passed through the coal region. Before any work was begun on the enterprise the hard times of 1835-36 came on. Many men who were aiding the Drinker road were ruined. Sir Charles Augustus Murray, an English capitalist, was then traveling in this country. He became informed of the intentions of Drinker and his confidants, and became interested in the enterprise. A meeting of the company was called at Easton, Penn. Sir Charles Murray was present. He agreed to raise \$500,000 in England to aid the road if the company would raise enough to begin work. Associated with Drinker and his chief aide was William Henry. By their united efforts they induced the Morris Canal Co. to agree to take \$150,000 in the stock of the railroad company, but pending the negotiations word was received from Sir Charles Murray that, owing to the business depression in England, he was unable to raise the money he had expected, and the work received what seemed to be its death blow. Both Drinker and Henry had used up their private fortunes in their efforts to carry the railroad scheme to success.

In 1836 nearly the entire site of the present city of Scranton was an unbroken wilderness. Three houses and a stone mill, known as Slocum's Hollow, were all the evidences of civilization that existed there. There were deposits of iron in the Hollow. The Slocums had smelted ore in a primitive furnace years before. This furnace was abandoned in 1826. In 1836 J. J. Albright was offered the land now occupied by Scranton, including Slocum Hollow and the iron mines, for \$10 an acre. He was interested in the iron business in Northampton County, and took a box of the Slocum Hollow ore to Easton to exhibit it. This was at the time the meeting of the Drinker railroad company was being held. William Henry and others learned of the iron ore in Albright's possession and of the offer he had from the owner of the land. This put an entirely new idea in Henry's mind, and that was to get possession of the iron mines and use them as a new inducement for capital to invest in their enterprise, making Slocum Hollow the objective point of the road between the Delaware and the Lackawanna. This was opposed by Drinker, who had the future welfare of Drinker's Beech in his mind as the reward of his efforts in building the railroad. Henry found only one adherent, and that was a New York capitalist by the name of Armstrong. Albright, failing to interest persons he expected to in the purchase of Slocum Hollow, did not make the purchase, and in 1840 William Henry bought 500 acres of the land for \$8,000. He gave a 30 days' draft for the money as the capitalist Armstrong. Before it could be accepted Armstrong

died. His administration insisted on Henry forfeiting the contract for the land. He asked for an extension of 30 days, which was granted. He went to George W. Scranton and Selden T. Scranton, of Oxford, N. J., and represented the situation. They made a visit to the wild region, journeying over the turnpike built by Henry W. Drinker in 1819. The coal and iron deposits of Slocum Hollow were an agreeable surprise to them, and they resolved at once to fill the place made vacant by the death of Mr. Armstrong, and fulfilled the contract made by Henry, and became the owners, with him, of the Slocum Hollow property.

The Scrantons established iron works at the Hollow and began the development of the region. The building of the Erie Railroad along the southern border of New York State turned their attention to an outlet by rail up the Susquehanna Valley to the Erie, rather than southward over the Pocono to the Delaware. Drinker had ceased to take an active part in the enterprise, and had turned his attention to retrieving the fortune he had lost in the efforts that had directed capital into the valley, by utilizing his large landed possessions. In 1847 the Scrantons purchased the old Leggett charter for a railroad up the Susquehanna, and built a locomotive railroad to Great Bend to Scranton, known as the Lackawanna & Western Railroad. This was completed in 1851. Until that time all travel to New York had been by stages to Middletown, N. Y., or to Narrowsburg, N. Y., where connection was made with the Erie. The journey required 10 days. The completion of the Lackawanna & Western reduced the time to one day, although the journey was twice as long. In 1849 the Scrantons procured a charter of the Water Gap & Cobb's Gap Railroad Co., and in 1853 bought Drinker's old charter for \$1,000. The Water Gap & Cobb's Gap Railroad Co. and the Lackawanna & Western Railroad Co. were consolidated under the name of the Delaware, Lackawanna & Western Railroad Co., and the road that Drinker had originated and had struggled so hard to build, was constructed from the Delaware to the Lackawanna. From the purchase of 500 acres of land for \$8,000, which was led to by the perseverance of Henry W. Drinker in bringing the resources of the wilderness to the attention of the outside world, the great Delaware & Lackawanna system of railroads has grown with its millions of wealth in coal lands. Upon that purchase the great Lackawanna Coal & Iron Co. and the city of Scranton, with its varied industries and rich surroundings, alone are founded. The coming of the Drinkers into the then uninhabited wilderness has been followed by the investment of hundreds of millions of capital.

Drinker, by the sale of his lands, which increased in value with the advent of the railroad and the development of the coal trade, died, leaving a large fortune, of which the Montrose branch of the family inherited largely. It is a melancholy reflection that the last representatives of the brilliant pioneer of the valley should be, the one a hopeless inmate of an asylum for the insane and the other the occupant of a murderer's cell.—*Honesdale (Pa.) Correspondence New York Times*.

THE SCRAP HEAP.

Baggage Smashers.

The Boston *Advertiser* speaks a good word for the baggeman as follows:

"It is never amiss and is always popular to denounce baggage-smashers, and the New York Legislature has enacted a law making the destruction of trunks, boxes, valises or packages by the railway baggage fiends a misdemeanor, with a penalty of \$50 for each offence. The law makes the railway which employs the baggage-smasher responsible for his havoc. There will be no more hurling of trunks from the cars to the platform as if they were a new kind of projectile, and a gaping trunk revealing all the fair owner's new dresses will become a rare sight.

"This is all very well, but there is another side that people ought not to lose sight of. The growth of trunks has been greater, relatively, than almost any other growth in this rapidly developing country. They are often too heavy for two strong men to handle with ease or safety, and when, as often happens, they must be moved by only one man and with the utmost celerity during the short stop of the train, the baggage fiend is more sinned against than sinning, and is entitled to the sympathy and protection of the public. There ought to be a law that no piece of baggage shall weigh more than a certain number of pounds—whatever weight an average man can lift with safety to his health and to the baggage. In that case, those who require very bulky packages would make them of light and flexible material. Railroad companies can regulate this if they will agree upon it, and more, in the interest of humanity than of property they ought to try."

The General Baggage Agents' Association and the General Passenger Agents' Association have tried to limit the weight of baggage, but the regulations which they have adopted have been met by denunciations from travelers, who either did not understand, or in their own interest would not understand, the reasonable nature of the rules. Perhaps the greatest sinners in this respect are the drummers or commercial travelers, who sample cases are the dread of the baggeman, and are often worse to handle than the Saratoga lady tourist carries to her summer resort.

Served Him Right.

"Poor fellow! poor fellow!" murmured a sympathizing old lady at the Broad street station, as the form of a man all wrapped in bandages was borne in a litter from an incoming train to an ambulance. "Poor fellow! He seems to be very much hurt. Do you know how it happened?"

"No, mum," answered a polite station hand.

"Maybe it was in a collision," suggested the old lady.

"There has been no collision on the road that I know of," was the reply.

"Could he have been run over?"

"He is not hurt enough for that."

"True. His limbs seem all right. The hurts seem to have come from bruises or blows," added the old lady.

"Yes, mum. Looks like it."

"But can't you guess how it happened?"

"I don't know, mum, unless he tried to take up a presidential vote."—*Philadelphia Call*.

Run into Something.

A New York Central locomotive stood close to the Main street crossing in Buffalo. The fireman was busy cleaning some blood and pieces of meat off the cowcatcher. "Don't shudder," he said, "nothin' but beef—a fool cow got on the track back here by Looneyville. Killed a man once at the same crossing. It's an unlucky spot I guess. Do we have many such accidents? Yes, a few. Did you ever hear of old Jerry Drew? Lives up near Rochester. No! Well, we had a scrimmage with him one day. He gets drunk every time he goes to town and that day he was drunker than ever. He alius seemed to get to the track 'bout time we got to the road an' I've seen him whip up his horses and whoop and yell and try to get there the same minute we did many a time. He seemed to delight in it. Once he stopped right on the track and when we came up slow with brakes on he dared us to come any closer and said he'd run over us. Had to whistle and scare his horses in order to get him off. The time I started out to tell you about, though, Jerry had bad

too much and was sound asleep in his wagon. The horses went on the track right in front of us and the whole institution was busted all to pieces. We stopped as quick as we could an' run back. Both horses was killed and the wagon all cut up to kindlin' wood an' scrap iron. Over by the fence was old Jerry. I saw he wasn't dead right away. The shock had woke him up an' he was tryin' to drink out of the neck of a bottle, the neck being all there was left of it. 'What's the matter here?' I shouted to him. He looked up, opened his eyes a little an' gazed around him. 'I guess he,' he said, 'I guess I must o'-hic—run into sumthin.'—*Chicago Herald.*

How It Was Found.

The Columbia (Pa.) Spy says: "A short time ago a lady riding in one of the cars of the Pennsylvania Railroad, west of Harrisburg, had the misfortune to lose a valuable bracelet. While putting up the window of the car it came unclashed and fell out. The loss was reported to the conductor, who took the name and address of the lady, and in four days afterward she had the satisfaction of having the bracelet returned to her. How was it done? By a very simple process. On arriving at the end of his route the conductor telephoned the loss to the various station-masters near where it occurred; the station-master of each section placed the facts in possession of the track-walkers, and the track-walkers were given orders to keep their eyes open on their routes for the bracelet. These men go over the track every day, their business being to see that no obstructions are on the road. In this way one of these walkers discovered the piece of jewelry, and returned it to the station-master, who sent it to headquarters, and from there it was returned to the owner."

An Unlucky Train.

A singular coincidence happened in connection with the recent accident on the West Shore road at Fairport. The day previous 15 cars out of the Globe line freight train of 40 cars were wrecked at Tuscarora, on the Buffalo-Philadelphia road. The remaining 25 cars were drawn to Genesee Junction, and the next day 24 of the 25 were broken in the Fairport accident.—*Rochester (N. Y.) Democrat and Chronicle.*

An Engineer's Quickness.

A dispatch from Poughkeepsie, N. Y., July 6, says: "The Summit steamboat express of the Ulster & Delaware Road, which left the Grand Hotel station at 3:40 p. m. stopped at Phoenicia and took on board three carloads of New York business men and others. The train was composed of an engine, baggage car, Pullman car, two West Shore cars, and three ordinary coaches. There were about 300 passengers on board. After leaving Mount Pleasant, going down grade, 25 miles an hour, the engineer saw, on rounding a curve, a mass of rocks partially covering the track. He applied the air-brakes, pulled the reverse lever over and opened the throttle wide, stopping the train in less than its length, but not before the rocks had stripped off all the steps from the left side of the train and broken every cast iron journal box away from every truck from the engine to the rear of the train. Not a truck was dislodged, nor did any of the passengers know of their perilous position until after the train stopped when they assisted the laboring men in removing the obstruction. The train reached Kingston one hour behind. On the way thither, after the accident, the passengers gave a vote of thanks to the engineer for his bravery and coolness."

Speak Gently to the Conductor.

A handsome girl in tailor-made suit twitted the coat of a Sixth-avenue car conductor and remarked:

"Say, Sir, will you let me off at —'s?"

"All right, Miss," answered the young man as he rang up her fare, "we go right by it."

"Of course," sarcastically, "and that's precisely what I don't want to do."

The passengers laughed, but the conductor didn't. He put that girl on the crosswalk three blocks above her destination and was a half mile away before she found it out.—*New York Times.*

Forged Tickets.

Three men, one a ticket agent on the Elevated road, another who was formerly a ticket agent, and the third a lithographer, were last week arrested in New York, charged with a conspiracy to swindle the Manhattan Elevated Co. by means of forged tickets. It appears that arrangements had been made to print and use these tickets to the amount of \$100,000, and it is said that several other ticket agents are suspected of being in the conspiracy. The existence of forged tickets had been suspected for some time, but tracing them up was not an easy matter. One of the men offered to make a full confession.

Running with a Crazy Engineer.

James Street, whose residence is on Sanderson avenue, was until last Thursday locomotive engineer on the Lehigh & Susquehanna Division of the Philadelphia & Reading Railroad. For many years he was in the employ of the New Jersey Central Railroad Co. He ran the fastest train on the road, and was considered to be one of its very best engineers. He had always been exceedingly careful, and accidents to his train were uncommon. For several months past Street is said to have had his mind on some sort of invention pertaining to railroading, and it is supposed that he has lost his mental equilibrium in consequence.

Last Thursday he started from Easton for Green Ridge with his passenger train. He ran it as well and as carefully as usual until he approached the Mauch Chunk station. Then he put on a full head of steam and shot past the station at a frightful rate of speed, rounding the sharp curves, and scaring the passengers. A number of persons who had bought tickets for Mauch Chunk were on the train, and on the station platform stood a score or more of people who desired to take the train for the North. They were almost dumbfounded to see the train fly past the station. Its speed seemed to increase as the distance between it and the station increased. The waiting passengers had never witnessed such a sight before as they wondered at the peculiarity of the experience, while the people on the train behind the insane engineer became more and more frightened as they flew over the iron highway. Among the watchers on the platform of the Mauch Chunk station was the local Superintendent of the railroad. He surmised that something was wrong with Engineer Street, for he had never known that hitherto faithful employee to disobey any rule of the road.

After the train had gone one mile or two past Mauch Chunk, the conductor pulled the bell-cord and stopped the train. Then he went to the engine and saw that Engineer Street's eyes looked wild, and that he appeared to be nervous and excitable. He took particular care not to say or do anything that would annoy him, and he was careful not to let Mr. Street think that he suspected his action in running past the station was induced by insanity. Neither did he reproach him for what he had done, but in a quiet and gentle way ordered him to back up to the Mauch Chunk station.

The train had been run over bridges and around sharp

curves at the rate of 60 miles an hour, and the cars had swayed so much from one side to the other of the track that the women and children passengers were pale from fright. Engineer Street obeyed the command, and backed the train down to Mauch Chunk. It was found that the boiler was nearly dry, and the wonder was that it did not explode. The Superintendent had Street taken to the police station, and placed another man on his engine. Street was not at all pleased at the change which had taken place in such a brief space, and he most strenuously objected to being forced to leave his train and be thrust into a prison cell. Street was well taken care of, however, and his treatment was gentle and kind. On the following day he was brought to this city and taken to his home at Green Ridge, and has since been sent to a private asylum.—*Scranton (Pa.) Republican.*

Train-Wreckers Captured.

A dispatch from Canton, Miss., July 8, says: "One of the train-wreckers who have made several attempts to throw the cars of the Illinois Central Railroad from the track near Duckbill, Miss., was arrested yesterday by detectives, on the information of a woman he was about to marry. She says he confessed to her that he belonged to the party. It is probable the other members of the gang will be captured."

The General's Staff.

A correspondent writes us from Louisville, Ky., as follows:

"Reading your 'Scrap Heap' reminds me of an incident told by Mr. G. T. Breed, formerly of the Louisville & Nashville Railroad. It occurred during the late unpleasantness; Mr. Breed then had charge of one of the Southern divisions of the Louisville & Nashville. The government had taken charge of the road and for sometime nothing but government troops and supplies were moved, but after a while the company was allowed to notify the public that trains would run as usual, except that there would be a car exclusively for ladies, owing to the number of questionable characters traveling at that time. On the following morning the train was ready to start, with a stalwart—but very green—brakeman guarding the door of the ladies' car, when up came General Hardee (author of 'Hardy's Tactics'), who was in command of the army at that place, and was surprised at being refused admittance to the car. 'Why can't I come in this car?' he demanded of the green brakeman, who was totally ignorant as to who General Hardee was, or his authority. 'Because it's for ladies only,' retorted G. B. 'Well, I tell you,' exclaimed Hardee, 'I am coming into this car and bring my staff with me.' 'And I tell you,' said the irate brakeman—who supposed the general's staff was a fishing pole or something of that sort—"if you want to ride on this train you will have to go in the next car, where you can stick your old staff out of the window.' This remark caused the General to laugh so much that he forgot his anger, and sought Superintendent Breed, where, amid much laughter, the matter was arranged without his having to stick his staff out of the window. 'You can imagine the brakeman's feelings when he found out whom he had refused.'

TECHNICAL.

Work on the Forth Bridge.

Favored by an exceptionally mild and open winter, the contractors have been able to make great progress with the works of the Forth bridge. In order to understand what has been done it is necessary to recall the fact that there are three distinct points at which the operations are being carried on—at the Queensferry or south bank of the Forth, at the Fife or north bank, and at the Island of Inchgarvie, between these. Besides these three scenes of activity on the site of the bridge itself, note must be taken of the workshops of the contractors at South Queensferry, where the whole of the metal work of the bridge is being prepared—not only the steel tubes of which the cantilevers are to be composed, but also the enormous circular caissons which are to be sunk in the river and are to receive the concrete foundations of the piers on which the cantilevers will rest. I shall first refer to the workshops. They cover a vast acre, and consist partly of covered sheds and partly of a wide, open space, over which there are laid down lines of rails for carrying the traveling shops, in which the steel tubes of the cantilevers are fitted together and built up. It may be noted that these workshops, as well as the works on the site of the bridge, are lighted with the electric light, so that the whole of the operations are carried on by night as well as by day, successive relays of workmen being engaged for that purpose. The number of workmen employed on the different parts of the work varies from 900 to 1,200. Most of them are located on the south side, and it may readily be understood that the housing and feeding of so large a body of artisans have been a matter of no small difficulty. Extensive bothies and a large canteen have been erected by the contractors in the vicinity of the workshops at South Queensferry. Though food is supplied in the canteen at very moderate rates, I understand that it has not so far proved a financial success, chiefly because Scottish workmen have a prejudice against co-operate feeding stores, and prefer to forage for themselves. It may be inferred, from the stupendous character of the works and from the number of men employed on it, that the plant required for carrying it on is very extensive. Its cost is estimated, on a rough basis, at £100,000.

So large are the steel tubes of which the cantilevers are to be formed that, instead of their constituent parts being taken to a workshop, the workshop has to be taken to them, and has to travel with them in the course of their construction. The horizontal tube which is to form part of the base of the first cantilever is now being put together. This tube is 150 ft. long and 12 ft. in diameter, and in its circumference there are 10 steel plates 1½ in. thick. The traveling shop engaged in its construction is self-contained. It has its own steam engine and boiler, its own system of drilling and riveting machines, and its own complement of workmen. At one and the same time the engine keeps five drilling and riveting machines in motion at different parts of the circumference, and pours jets of water on the drills to counteract the friction. From this operation one gets a better idea of the vastness and the difficulty of the work than from any description of it. If the mere base line of the cantilever is so enormous what will the completed structure be? I may recall the fact, already mentioned in a former letter, that three cantilevers are to be employed in spanning the deep channel on either side of the island of Inchgarvie; one on that island, one on the south side, and one on the north side. Each cantilever will rest on four piers of solid masonry, resting on a bed of concrete; each of them will rise to the height of 350 ft. above the piers, and will stretch out an arm 680 ft. long right and left of the centre.

One of the most difficult operations in the construction of the bridge will be that of building the stone piers, four in number, on which each of the cantilevers will rest. For the foundation of each pier an immense circular caisson of iron will be sunk in the bed of the estuary, and will afterward be filled in with concrete. Each of these caissons resembles a huge gasometer or hollow martello tower 61½ ft.

in diameter, and rising to 20 ft. or 30 ft. above the ground. The lowest part of it is an air-tight chamber, in effect a vast diving-bell, in which after it has been placed *in situ* the excavators will work, comfortably enough, it is expected, with constant supplies of compressed air. Very satisfactory progress has been made with the construction of the stone piers which are to carry the horizontal girders between the shore and the cantilevers on each side of the river. On the north side there are, besides a massive abutment which is completed, four viaduct piers, and a large cantilever pier on which the arm of the cantilever will rest. The viaduct piers have been carried up to a height of 30 ft., and the girders which they are to carry are now being put together, and will be placed in position before the piers are proceeded with further. This strikes the lay mind as being one of the most astonishing feats of the undertaking. The girders are to be placed on the piers, which are only 30 ft. high, and the masonry of the piers is to be carried up 100 ft. higher, with the girders resting on the top of them. On the north side, one of the round piers which are to form the foundations of the cantilever has been carried up to the level of the under side of the coping. It is filled in with blue bricks to depth of 8 ft., through which rises a system of iron rods and holding-down bolts to carry the plate on which the cantilever will rest.

There is great activity in the island of Inchgarvie, the face of which has been completely transformed. The old castle, till lately a ruin, would not know itself even if it were endowed with consciousness. It has been roofed in and converted into a very comfortable habitation, containing a very handsome office for the Superintendent, workshops, store-rooms, and sleeping-rooms for a number of workmen. The old battery has been turned to good account in similar ways. The machinery on the island includes a compressed air-engine, a powerful steam-engine, an electric machine, and a hydraulic accumulator. The permanent cai-son for the foundation of one of the four circular cantilever piers has been riveted up and lowered into position. Although great progress has now been made with the substructure of the bridge, and although it already makes a good show above water, the work has not advanced beyond the preliminary stage. It is difficult to say within what time the bridge will be completed, as very much depends on the kind of weather with which the contractors may be favored. I believe they will consider themselves fortunate if they are able to hand over the completed structure to the company within six years from the present time. Of the appearance of the bridge as a feature in a landscape it would be dangerous as yet to hazard an opinion. The plan gives promise of a curious rather than of a pleasing object; but vast as are the dimensions of the cantilevers taken separately, they will probably become less obtrusive, and will lose some of their peculiar character when they are merged in a wide view of sea and land.—*London Times.*

ANNUAL REPORTS.

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Chesapeake & Ohio Canal.	145
Chicago & Alton.	145
Chi., Burlington & Quincy.	318
Chi., Rock Island & Pac.	445
Chi., St. Louis & Pittsburgh.	398
Chi., St. Paul, Minn. & Omaha.	374
Chi. & Muskingum Valley.	410
Cin., New Orleans & Tex. Pa.	161
Cin., Wash. & Baltimore.	445
Cleveland, C. & St. L. Ry. & W. D.	512
Cleveland & Western.	161
Cleveland & Pittsburgh.	46
Columbus & Greenville.	87
Columbus, Hocking Vy. & Tol.	202
Concord.	392
Connecticut River.	61
Consolidated Coal Co.	261
Cumberland Valley.	149
Dela. & Hud. Canal Co.	140, 231
Delaware, Lacka. & Western.	165
Denver & Rio Grande.	296
Eastern R. R. Association.	351
Eliz., Lexington & Big Sandy.	375
Fitchburg.	47
Franklin.	147
Han., Janes, Han. & Gettysburg.	187
Hartford & Conn. Western.	165
Houstonian.	196
Houston & Texas Central.	211
Huntingdon & Broad Top Mt.	107
Illinois Central.	104, 202
Internat'l. & Great Northern.	87
Iowa Central.	395
Knox & Lincoln.	57
Lake Shore & Mich. Southern.	358
Lehigh Coal and Navigation Co.	147
Lehigh Valley.	47, 139
Little Miami.	196
Little Rock & Fort Smith.	463
Long Island & St. L.	512
Mackinaw, Huron & Ont.	393
Michigan Central.	279
Michigan Central.	359
Milwaukee, Lake Sh. & West.	27
Mississippi & Tennessee.	8
Missouri, Kansas & Texas.	337
Montgomery & Wells River.	415
New Haven & Northampton.	147
N. Y. & St. L. & St. Louis.	170
N. Y., Lake Erie & Western.	291
N. Y., N. Haven & Hartford.	27
N. Y., Ontario & Western.	106
N. Y., Pennsylvania & Ohio.	159
N. Y., Susquehanna & West.	147
Norfolk & Western.	260
Northrn (New Hampshire).	411
Pennsylvania & New York.	149
Pennsylvania Railroad.	181
Perkiom.	87
Petersburg.	47
Philadelphia & Reading.	27, 64
Philadelph. & Wil. & Bar.	106
Pittsburgh & Allegheny.	101
Pittsburgh, Cin. & St. Louis.	41
Pittsburgh & Lake Erie.	41
Pittsburgh, McK. & Yough.	63
Pittsburgh, Wheeling & Ky.	410
Portland & Ogdensburg.	87
Portland & Rochester.	107
Provident & Worcester.	46
Richmond & Danville.	23
Rochester & Pittsburgh.	241
Rome, Water. & Ogdensburg.	427
S. L., Iron Mountain & So.	397
S. L. & St. Francisco.	297
S. L. & St. Vandalia & T. H.	116
S. L. & St. Louis.	147
Sandy River.	37
Savannah, Florida & Western.	336
Seaboard & Roanoke.	399
Shenango & Allegheny.	593
South Carolina.	105
Terre Haute & Indianapolis.	494
Territory & Logansport.	394
Texas & Pacific.	196, 397
Toledo, Ann Arbor & G. T.	463
Troy & Greenfield.	46
Union Pacific.	195, 202
Vermont Valley.	87
Vermont.	512
Wabash, St. L. & Pacific.	397
Wabash, W. I. & Ry.	9
West Jersey.	87
West Va. Central & Pittsburgh.	26
Wilmington, Col. & Augusta.	8
Wilmington & Weldon.	9
Wyo. & Peachbottom.	411

Mobile & Ohio.

economical handling of, the increasing coal and lumber traffic on and tributary to the road, there has been expended the sum of \$34,000 in permanent improvements, not connected with the current business of the past season. This amount has been charged to the renewal fund, and with this exception, all expenditures of every kind and nature have been charged to, and are included in, expenses. The company has no floating debt.

Indiana, Bloomington & Western.

At the close of its last fiscal year, Dec. 31, 1883, this company worked the following lines:

	Miles.
Peoria Division, Indianapolis, Ind., to Pekin, Ill.	202.5
" Pekin to Peoria, leased	9.0
Middle Division, Indianapolis to Springfield, O.	142.0
St. Louis Div. (Indianapolis, Decatur & Springfield), leased	152.5
Ohio Div. (Cincinnati, Sandusky & Cleveland), leased	190.0
Total	696.0

The Ohio Division has been leased from May 1, 1881, and the St. Louis Division from Jan. 1, 1882. The Middle Division was not completed until near the end of 1882.

The general account is as follows:

	\$10,000,000.00
Funded debt	14,137,300.00
Current vouchers and bills payable	385,629.02
Accrued interest not yet due	222,215.67
Balance to credit of income	505,874.99
Total	\$25,341,019.68
Cost of property	\$24,727,265.96
Supplies for current use	244,809.56
Balances due	108,010.96
Cash on hand or in transit	260,933.20

Stock was unchanged, but the funded debt was increased by \$500,000 during the year.

The earnings for the year were as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Freight	\$1,699,310	\$1,554,616	I. \$144,694	9.3
Passengers	1,046	924,726	I. 95,738	10.3
Mail and express	127,773	112,822	I. 14,945	13.2
Rents, etc.	174,819	148,057	I. 26,762	18.1
Total	\$3,022,366	\$2,740,227	I. \$282,139	10.3
Expenses	1,12,674	1,78,903	I. 124,771	7.0
Net earnings	\$1,109,692	\$952,324	I. \$157,368	14.8
Gross earn. per mile	4,434	4,946	D. 603	12.3
Net	1,594	1,719	D. 125	7.3
Per cent. of exps.	63.28	67.25	D. 3.97	...

The mileage last year was greater than that of 1882 by the 142 miles of the Middle Division, which was under construction in 1882.

Payments from net earnings were as follows:

	\$1,109,692
Interest	\$433,375
Rents	569,104
Taxes	73,173
Other disbursements	20,752

Balance, surplus for the year. \$13,228

In 1882 the charges exceeded the net earnings by \$43,314, showing an improvement of \$56,542 last year, notwithstanding an increase in interest charges for the year.

Peoria, Decatur & Evansville.

This company operates a line from Peoria, Ill., to Evansville, Ind., 248 miles, with a branch to New Harmony, Ind., 6 miles, making 254 miles in all. Of this line 242 miles are owned, 10 miles from Peoria to Pekin being leased from the Peoria & Pekin Union Co., and 2 miles, through Decatur, from the Illinois Central. There are 38.98 miles of sidings owned by the company. The report is for the year ending Dec. 31.

The present company was formed by consolidation of the Pekin, Linc & Decatur, the Decatur, Mattoon & Southern, the Grayville & Mattoon and the Evansville & Peoria companies.

The equipment consists of 30 locomotives; 12 passenger; 3 combination and 2 baggage cars; 1,055 box, 100 stock, 177 coal, 91 flat and 16 caboose cars; 1 officers' car, 1 derrick car and 1 pile-driver.

The balance sheet, condensed, is as follows:

	\$8,400,000.00
Stock	4,845,000.00
Funded debt	2,990,000.00
Accounts and balances	211,363.37
Income account, balance	49,349.91
Total	\$13,505,713.28
Road and equipment	\$13,279,168.66
Trade securities	57,300.00
Materials	22,284.00
Accounts and balances	94,464.14
Cash	52,497.49

The funded debt consists of \$2,757,000 first-mortgage 6 per cent. bonds and \$2,088,000 income 6 per cent. bonds. The yearly interest charge, excluding the income bonds, is \$165,420; including the incomes, it is \$290,700, or \$1,144 per mile.

The traffic for the year was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Passenger	172,992	182,385	I. 9,393	51.2
Freight	300,113	310,953	I. 10,820	3.5
Other	15,414	31,385	I. 15,971	51.5
Total	488,519	524,703	D. 36,184	6.9
Pass. carried	264,364	270,585	D. 6,221	2.3
Passenger-miles	5,919,381	5,909,005	I. 10,286	0.2
Tons freight carried	357,390	397,671	D. 40,281	10.1
Ton-miles	34,105,656	43,458,824	D. 9,353,168	21.5

The traffic for the year was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Freight	1,162,992	1,182,385	D. 18,207	3.5
Passenger	108,647	60,701	I. 47,946	78.6
Total	\$721,555	\$763,584	D. \$42,329	5.5
Expenses	424,080	506,672	D. 82,502	16.3

The decrease in gross earnings was due to the light crops

on the line and to light Southern demand for corn. The reduction in expenses was chiefly in maintenance of way and buildings, and in train service.

The income account is as follows:

	\$297,175.40
Interest on bonds	\$165,420.00
" equipment certificates	20,358.33
Rentals, etc.	58,505.37
Equipment certificates retired	40,000.00
	284,282.70
Surplus for the year	\$12,891.73
Balance from previous year	36,458.21
Balance, Dec. 31, 1883	\$49,349.91

Interest is on the first-mortgage bonds only, none having been paid on the income bonds.

The General Manager's report gives the following description of the property: "The road is tied with oak ties, and will average 2,900 to the mile, in fair state of preservation, requiring only the ordinary percentage of renewals annually. There yet remains 107 miles of iron in the main line, which is considerably worn, and should be renewed with steel as rapidly as the earnings of the road will permit. In this connection it is proper to state that 3,000 tons of steel are contracted for to be laid in 1884, which will materially improve the property and reduce the number of miles of iron to 71 miles. The road is ballasted with the native soil, which furnishes fair light ballast, but requires additional labor to keep track in surface, over and above what would be required if gravel or broken soil could be had. Right of way, generally 100 ft. in width, is secured."

"At all of the principal stations additional grounds are owned for station houses, stock yards, elevators and side track purposes.

"At Pekin, Ill., the company has ample side tracks, 12,552 linear feet, and in addition to passenger and freight station has a round house (four stalls), an ice house and small repair shop.

"At Mattoon, Ill., are located the general repair shops, consisting of brick-round house (ten stalls); blacksmith shop 71 by 36 ft.; locomotive repair shop 71 by 116 ft.; engine and boiler house 50 by 72 ft.; two car shops 101 by 71 ft. each; storehouse 26 by 110 ft.; wood, passenger and freight station, eating house and elevator, with 26,000 linear feet of side tracks, furnishing very complete and ample facilities for the conduct of business at that point, the different repair shops being amply supplied with machinery and tools for general repairs.

"At Evansville, Ind., the company has a very valuable property, consisting of brick passenger station, two stories, 25 by 70 ft., machine shop 70 by 100 ft., engine and boiler room 36 by 60 ft., car shop 70 by 100 ft., and 14,000 linear feet of side tracks.

"At all of the local stations, 45 in number, your company has station buildings, stock yards and sidings sufficient for present wants, and at many of them sufficient for large increases.

"The road is fenced on both sides for its entire length, the line south of Decatur with a good five-wire fence, all built within the last three years, that north of Decatur to Pekin originally a five-board fence, and about 11 years old, will require considerable renewal and repairs during the coming year.

"Water stations, 14 in number, in good repair, are distributed along the line, generally about 18 miles apart."

Kansas City, Fort Scott & Gulf.

At the close of its last fiscal year this company operated the following lines:

	Miles.
Kansas City, Fort Scott & Gulf, Kansas City to the south	159.92
line of L. & S.	27.54
Rich Hill Railroad	102.85
Fort Scott-Southeastern & Memphis	26.18
Kansas & Missouri	22.38
Short Creek & Joplin	49.79
Memphis, Kansas & Colorado	

Total, Dec. 31, 1883. 388.66

There was no change in mileage during the year. The leased lines named are owned by the company, which holds all their stock and guarantees their bonds.

The Kansas City, Springfield & Memphis road, from Springfield, Mo., to Memphis, Tenn., is owned by the owners of this road, and is operated in its interest, but has a distinct organization and is not included in the report.

The balance sheet, condensed, is as follows:

	\$4,648,000.00
Common stock	2,750,000.00
Preferred stock contracts	2,484,000.00
Bonds	75,769.61
Sinking funds, leased lines	95,346.61
Land income account	259,502.55
Accounts and balances	446,498.09

Total. \$10,740,116.25

Road and equipment. \$9,333,875.27

Stock of leased lines. 662,867.20

Advances to leased lines. 351,745.01

Sinking funds. 149,982.07

Materials. 156,609.59

Bills receivable. 44,500.00

Cash. 40,817.11

Total. 10,740,116.25

Included in the first-mortgage bonds are \$65,000 which were drawn for redemption, interest ceasing Jan. 1, 1884; this reduces the amount to \$2,400,000. The company also guarantees \$2,399,000 leased line bonds bearing 7 per cent. interest; \$890,000 at 5 per cent. and \$525,000 Fort Scott Equipment Co. 6 per cent. bonds. The interest charge on all these bonds is \$386,930 yearly.

The traffic for the year was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Locomotive miles	1,532,995	1,366,730	I. 163,265	11.9



Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS OF railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE HALF-YEAR'S GRAIN MOVEMENT.

The character of the grain movement this year has been truly remarkable. Contrary to what seems to be the universal opinion of those who talk about it in the newspapers, the aggregate movement, so far as it can be traced, has not been light, in spite of the short crops last year. It is true that the receipts at the Northwestern markets have been unusually light since navigation opened, and in June were the smallest since 1873, with the exception of 1875, 1877, 1878 and 1882, even 1874 and 1876 showing larger June receipts; and we have an increase over railroad mileage 60 per cent. meanwhile, from 74,000 miles at the end of 1875 to 120,000 at the end of 1883, so that the same aggregate movement means a great deal less per mile of road engaged in carrying it. But taking the six months ending with June, the Northwestern grain receipts this year have been exceeded but three times, and then not very much, by 7½ per cent. last year, by 8 per cent. in 1881, and by 12 per cent. in 1880, when they were largest.

But we have heard much of the locking-up of stocks of grain in the Northwestern elevators, from which we might suppose that though the receipts of Northwestern markets may have been large, their shipments were unusually small. But, in fact, the shipments have been larger in proportion than the receipts, and have been exceeded but once in the history of the trade, in 1880, when they were 6½ per cent. more than this year. But the shipments were 4½ per cent. larger this year than last, though there was much less wheat and corn produced.

But while we fail to find any slackness in movement to or from the great Northwestern markets, we find a very marked decrease in the receipts of the Atlantic ports, which, for the six months, were not only 24 millions of bushels (28 per cent.) less than last year, 47 millions less than in 1881, and 61 millions less than in 1880, but were 14 millions less than in 1876, and 8½ millions less than in 1874. For the six months ending with June the receipts and shipments at the eight reporting Northwestern markets (St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland), and the receipts of the seven Atlantic ports, for 11 successive years, have been, in bushels, flour not included:

Year.	Northwestern Receipts.	Northwestern Shipments.	Atlantic Receipts.
1874.....	85,287,705	62,451,630	71,876,593
1875.....	59,718,108	44,071,475	56,378,763
1876.....	80,302,671	70,535,200	77,491,653
1877.....	58,119,118	47,764,639	50,029,575
1878.....	97,407,756	80,270,321	107,929,355
1879.....	99,466,816	84,570,888	115,927,223
1880.....	116,279,392	104,218,067	124,069,450
1881.....	107,397,700	93,576,637	110,208,773
1882.....	82,906,849	68,586,324	51,129,115
1883.....	111,730,461	93,489,702	87,131,848
1884.....	103,918,343	97,748,718	63,135,094

Never before have the shipments of the Northwestern

markets kept pace with the receipts so closely. In 1874 the shipments were 23 millions (27 per cent.) less than the receipts; last year they were 18 millions less; in no year until this was the excess of receipts less than 9½ millions; but this year the shipments are only 6½ millions (6 per cent.) less than the receipts. What accumulations there are (and they cannot be called very large), are chiefly such as had accumulated at the close of 1883.

But the large shipments from the West have found a market to an unusual extent west of the seaboard. Besides what goes from the reporting markets there are very large shipments made from places that do not report, both to the seaboard and to interior points. In 1874 the total Atlantic receipts exceeded the shipments of the Northwestern reporting markets by 9 million bushels (15 per cent.), in 1878 by 27 millions, in 1881 by 16½ millions. But since 1881 the tide has turned, exports have fallen off greatly, and the Atlantic receipts have been less than the shipments from the reporting Northwestern markets—in 1882 17½ millions less, last year 6½ millions less, and this year the immense amount of 34½ millions (35 per cent.) less. It is really remarkable that there should have been such an unusual absorption of grain by the country between the West and the seaboard. Since 1881 the Northwestern shipments of grain have increased 4.2 millions, while the Atlantic receipts have decreased 47 millions. Yet the grain has found a market apparently as well this year as ever, and at low prices for wheat only.

The June grain movement to the Northwestern markets was light, as we have said; but the movement from these markets in June was larger this year than last, and has been exceeded only in 1881, 1880 and 1879, and only slightly in 1879; but the Atlantic receipts are much as for the half-year—unusually light, and even lighter than in 1874 and 1876.

For 11 years the June movement has been:

	Grain Movement in June.	Northwestern Receipts	Northwestern Shipments	Atlantic Receipts
1874.....	22,896,409	19,873,225	21,662,292	
1875.....	12,508,108	14,064,008	15,001,843	
1876.....	24,774,123	25,098,148	25,372,062	
1877.....	11,033,020	12,574,006	12,722,544	
1878.....	19,293,232	18,084,931	18,831,973	
1779.....	26,219,547	25,041,170	23,593,630	
1880.....	20,144,952	34,073,966	41,428,461	
1881.....	37,038,787	30,267,593	31,578,418	
1882.....	15,491,351	15,236,383	13,040,980	
1883.....	24,122,316	20,996,194	18,987,206	
1884.....	21,848,080	24,407,642	17,965,556	

The shipments were larger than the receipts of the Northwestern markets this year, which has seldom occurred in June, when the receipts are often the largest of the year, but the shipments exceeded the receipts still more in 1880.

The receipts at each of the Northwestern markets during the half year for the last five years have been, in bushels:

	1874	1875	1876	1877	1878
Chicago.....	54,515,863	46,702,631	30,850,594	54,050,089	51,401,482
Milwaukee.....	7,527,492	8,083,808	7,775,550	9,058,700	8,105,573
Toledo.....	14,327,457	11,636,850	8,210,906*	9,135,276	6,946,533
Detroit.....	9,857,749	3,601,996	3,154,26	4,047,784	3,749,933
Cleveland.....	2,288,810	2,288,736	1,490,429	2,031,234	1,622,849
St. Louis.....	21,797,583	21,386,216	15,780,249	20,493,985	18,976,423
Peoria.....	10,885,165	13,111,830	11,241,130	10,391,540	12,111,535
Duluth.....	1,621,542	165,034	57,1975	1,075,411	1,004,682
Total.....	116,279,392	107,137,000	82,366,849	111,730,461	103,918,343

The totals show inconsiderable fluctuations, except in 1882, after the very poor crops of 1881, but there has been some change in the position of the several markets. Since 1880 there has been a decrease of 12,861,000 in the total receipts for instance, but it is made up of—

A loss of..... 3,114,000 bu. = 6 per cent. at Chicago.

"..... 7,381,000 " = 51½ " Toledo.

"..... 2,821,000 " = 13 " St. Louis.

"..... 706,000 " = 30% " Cleveland.

"..... 126,000 " = 3½ " Detroit.

"..... 17,000 " = 1½ " Duluth.

14,165,000

A gain of..... 1,226,000 " = 11½ " Peoria.

"..... 578,000 " = 7½ " Milwaukee.

What is most noticeable here is the immense falling-off at Toledo and the gain at Peoria. But the changes from 1881 are still more striking. There has been a decrease of only 3,219,000 bushels (8 per cent.) in the total since that year, while at Chicago there has been an increase of 4.6 millions, and a decrease everywhere else except Duluth.

The percentages of the total receipt at each of these places in the several years have been:

	1880	1881	1882	1883	1884
Chicago.....	46.9	43.7	44.1	48.4	49.5
Milwaukee.....	6.5	7.5	9.4	8.6	7.8
Toledo.....	12.3	10.9	7.6	8.2	6.7
Detroit.....	3.3	3.4	3.8	4.4	3.6
Cleveland.....	2.0	2.1	1.8	1.8	1.0
St. Louis.....	18.7	20.0	19.2	18.3	18.2
Peoria.....	9.4	12.2	13.4	9.3	11.7
Duluth.....	0.9	0.2	0.7	1.0	0.9
Total.....	100.0	100.0	100.0	100.0	100.0

Thus Chicago's share has been growing larger every year since 1881; Toledo's is smallest this year; St. Louis also has its smallest percentage this year, but not much less than in other years, and Peoria has little more than its average percentage.

We may place them in three groups—Chicago, Mil-

waukee and Duluth the "Northwestern" group; Peoria and St. Louis the "Interior" group, and Detroit, Toledo and Cleveland the "Lake Erie" group, and find the percentages of each group to have been:

	1880	1881	1882	1883	1884
Northwestern.....	54.3	51.4	54.2	58.0	58.2
Interior.....	28.1	32.2	32.6	27.6	29.9
Lake Erie.....	17.6	16.4	13.2	14.4	11.9

The ports west of Lake Michigan gain, as should be expected, as it is a new country tributary to them which has been growing most rapidly of late years. A large corn crop might change the percentages, however; it would increase the receipts of St. Louis, Peoria and Toledo largely, but probably those of Chicago more than all. High rail rates tend to increase the receipts of the lake ports and especially of Chicago and Milwaukee, and their gains this year have been in spite of very low rail rates.

The receipts at the Atlantic ports have been so small this year that there is not the same interest in their distribution as at times when the exports are large. The domestic trade of the several cities is not much affected by their competition with each other. New Orleans, for instance, in almost any condition of competition will receive the amount of grain required for itself and the places near by which it supplies, which does not vary much from year to year; but the relative rates by river, by lake and by rail may greatly affect the amount which it receives for export. In 1881, for instance, in the first half of the year it received 3½ times as much as in 1882. Thus the places which export least are likely to have their business affected least by a short crop and light total business. We see this in the case of Boston, which received but 1.6 millions less this year than last, while the decrease at New York was 8 millions, at Philadelphia 4.1 millions, at Baltimore 3½ millions, and at New Orleans 5 millions. The total decrease is so great that at almost every important exporting point the falling off is enormous, and must be felt very seriously in trade and the demand for shipping. Compared with 1880, for instance, the decrease was:

	At New York, 25.0 million bushels.....	At Philadelphia, 16.8	At Baltimore, 9.8	At New Orleans, 5.6	At Boston, 2.0	At Montreal, 1.7	47 per cent.
"Philadelphia,	"	"	"	"	"	"	75 "
"Baltimore,	"	"	"	"	"	"	47 "
"New Orleans,	"	"	"	"	"	"	47 "
"Boston,	"	"	"	"	"	"	19 "
"Montreal,	"	"	"	"	"	"	40 "

At Portland the receipts were substantially unchanged, and the aggregate decrease was 60.9 millions bushels, which is 49 per cent.

The quantity received at each Atlantic port during the first half of the year for nine successive years has been, in millions of bushels:

	1876. 1877. 1878. 1879. 1880. 1881. 1882. 1883. 1884.
New York.....	30.5 19.9 49.1 47.5 53.8 49.2 28.7 36.7 28.7
Boston.....	6.0 5.7 8.4 9.5 10.4 11.6 8.8 10.1 8.5
Portland.....	1.5 0.7 1.4 1.0 1.6 1.1 1.0 1.7 1.6
Montreal.....	4.4 2.7 3.7 3.7 4.3 4.2 4.2 4.

ings per mile, and all but three decreases in total earnings. With an increase of 47 per cent. in mileage, the Northern Pacific makes an increase of 32 per cent. in earnings; the St. Paul & Omaha gains 10 per cent. in mileage and 44 per cent. in earnings, and the Central Iowa 81 per cent. in mileage and 9 per cent. in earnings.

All four of the roads northwest of St. Paul have reported, in the aggregate, as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Miles.	6,518	4,711	1,807	38.6
Earnings.	\$2,444,189	\$2,296,520	+\$17,660	6.4
Earn. per mile.	375	430	55	12.8

This is not very different from the showing which the same group made in May. The decrease of the Canadian Pacific is not so large and that of the Manitoba not nearly so large, but the increase of the Northern Pacific is a great deal smaller. The increase in the earnings of this group of roads, which are in the part of America most recently settled, has been as follows in successive months of this year:

	Increase.	P. c.	Increase.	P. c.
Jan....	\$208,523	18.3	April.....	\$714,172 36.5
Feb....	193,935	19.1	May.....	356,049 16.6
March....	267,442	15.9	June.....	147,669 6.4

In the first quarter of the year the gains were tolerably even, and not nearly in proportion to the increase in mileage; in April the increase was enormous, owing to the sudden and great movement of traffic over the Northern Pacific after spring opened. The percentage of increase fell below that in the winter in May, notwithstanding a very large increase on the Northern Pacific (69 per cent.), and in June the increase, considering the great increase in mileage, is very small. The course on the Northern Pacific has been remarkable. Its earnings remained very light until April, and then all at once became larger than ever before in the history of the road. Since April they have fallen off steadily, although in every year heretofore they have increased steadily from April till July at least. The course has been so unusual that we give here the earnings in each of the first six months of the year for five successive years:

	1884.	1883.	1882.	1881.	1880
Jan..	\$614,103	\$358,985	\$245,369	\$116,508	\$81,390
Feb..	520,083	328,156	268,935	78,803	77,239
March....	978,956	563,903	373,141	162,984	119,358
April....	1,441,514	6,041,421	451,023	216,210	186,074
May....	1,280,700	789,946	616,231	312,705	217,613
June....	1,095,785	829,657	704,617	412,024	253,105
July....	850,233	694,067	393,252	247,020	

This year the earnings were 24 per cent. less in June than in April; in every other year they have been much larger in June—26 per cent. last year, 56 per cent. in 1882, 90 per cent. in 1881, and 112 per cent. in 1880. The earnings this year would not appear small in June, however, if they had not been so much larger in April. They were \$439 per mile in June, against \$504 on the Northwestern and \$403 on the Milwaukee & St. Paul. In the absence of any rush of immigrants and speculators, it is not likely that there will be a gain over June in July or August, when the people on this road have little to ship and plenty of work to do, though heretofore earnings have been usually larger in August than in any earlier month, and last year much larger; but in September the new crops begin to tell, and in the three fall months the earnings are heaviest.

The other seven railroads west and northwest of Chicago that report make the following aggregates of mileage and earnings:

	1884.	1883.	Inc. or dec.	P. c.
Miles....	12,287	11,541	+ 726	6.3
Earnings....	\$5,244,086	\$3,824,839	+\$400,750	6.9
Earn. per mile....	442	504	— 62	12.3

There remain several roads in this territory to report, but the above have nine-tenths of the mileage (of the reporting roads) and a larger proportion of the earnings. The same roads in May had an aggregate decrease of but \$65,005, against this of \$400,750 in June, so that for them June was much less favorable than May. The largest decreases are 244 per cent. by the Iowa lines of the Illinois Central and 12 by the Northwestern. The gains and losses of these roads for the last five months have been:

	Av. Jan.	to March.	April.	May.	June.
C. M. & St. P....	— \$28,658	— \$23,270	— \$47,513	— \$104,180	
C. St. P., M. & Om.	+	+	+	+	
C. & N. W....	+ 30,100	+ 114,029	+ 55,337	+ 19,860	
Burl. C. R. & N....	— 35,403	— 50,421	— 84,123	— 270,189	
Ill. Cen. in Iowa....	— 1,380	— 677	— 10,901	— 10,197	
Ill. Cen. Iowa....	+ 10,400	+ 25,667	+ 22,787	+ 40,908	
Cen. Iowa....	+ 17,000	+ 22,102	+ 17,446	+ 8,406	
Chic. & Alton....	+ 14,448	+ 5,026	+ 3,774	+ 3,545	
Total....	— \$23,155	+ \$142,864	+ \$57,965	+ \$400,750	

For the five months ending with May these seven roads earned \$15,434 more than last year; in June, \$400,750 less. The June decrease would not be very important, however, if there was not a considerable increase in mileage.

These two groups west and northwest of Chicago have 18,785 miles out of the whole 34,163 reporting. There are not enough in any other district reporting to enable us to judge of the

general course of earnings in the district except west and southwest of St. Louis, where we have a report from the great Gould system, amounting by itself to 5,156 miles. West of St. Louis, that is, in Missouri and Kansas, there is every indication that traffic and earnings are heavy. Thus the Central Branch, wholly in Kansas, gained 18 per cent. over its large earnings last year, and the St. Louis & San Francisco, which has some road in Arkansas, but is chiefly in Missouri and Kansas, gained 244 per cent. On the other hand, the indications are that the lines in Texas have suffered a material decrease, and the Texas & Pacific reports one of no less than 244 per cent. In reporting, the Missouri Pacific is united with the Iron Mountain; together they gained 84 per cent., made up probably of a very large increase on the Missouri Pacific and a large decrease on the Iron Mountain. Likewise only one statement is made of the earnings of the Missouri, Kansas & Texas and the International & Great Northern, showing an increase of 84 per cent. The northern part of the Missouri, Kansas & Texas probably gained largely, while the International & Great Northern probably lost largely, like the Texas & Pacific. In the aggregate, this group of roads earned:

	1884.	1883.	Increase.	P. c.
Miles....	5,906	5,880	26 0.4
Earnings....	\$2,895,453	\$2,756,231	\$139,222 5.0
Earn. per mile....	498	469	21 4.5

This is a very good showing indeed for these times in spite of the large decrease of the Texas & Pacific and probably of the other Texas and Arkansas roads.

In the extreme West we have the report of the great system of the Central Pacific, which includes nearly all the important lines in California, and has the whole of the transcontinental traffic to and from California. Its earnings were 14 per cent. less than last year, and also smaller than in any previous June since 1880, and also smaller than in May or April, which has not happened before. This road has had a decrease every month this year, as follows:

	Jan.	Feb.	March.	April.	May.	June.
\$164,681	\$81,952	\$400,533	\$16,313	\$65,420	\$8,93,000	
9.4 p.c.	5.6 p.c.	19.6 p.c.	0.8 p.c.	3.1 p.c.	14.1 p.c.	

making for the last half-year a decrease of \$1,021,000, or nearly 9 per cent. The exceptionally large decrease in June was probably chiefly due to the blockade of the Southern Pacific by washouts for a large part of the month.

The three Southern roads that report have shown gains and losses as follows:

	June.	May.	April.	Jan. to Mar.
Mobile & Ohio....	+ \$6,515	+ \$41,134	+ \$41,134	— \$29,717
Louisville & Nash....	— 49,920	+ \$5,506	+ 156,300	— 42,761
Fla. Ry. & Nav....	+ 9,500	+ 11,319	+ 15,445	+ 36,683

The two roads in the East have shown gains and losses as follows:

	June.	May.	April.	Mar. 31.
Long Island....	— \$8,477	+ \$11,278	+ \$15,702	+ \$16,669
Roch. & Pitts....	+ 49,362	+ 49,203	+ 32,030	+ 157,189

The Long Island gains largely by summer travel, but the gain over previous months was less this year than last in June.

Last year it earned \$124,529 (73 per cent.) more in June than in April; this year only \$100,350 (51 per cent.) more. The Rochester & Pittsburgh had hardly got to work last year. Neither of these roads is of much significance in indicating what the course of earnings has been on Eastern roads. The returns from the South are more important, but still very incomplete, and of the roads north of the Ohio we have these:

	Three mos. to	Mar. 31.
Ill. Cen.	June.	May.
Ill. & So. Div....	— \$26,739	+ \$41,228
Chic. & E. Ill....	— 18,016	+ 13,433

The Illinois Central did not do so well in June as in May and April, but much better than in the previous three months, and the Eastern Illinois had a somewhat larger decrease than previously.

From all this it appears that June was the most unfavorable month for earnings we have had this year so far. It is near the close of the crop-year, and of a decidedly bad crop-year, but the reduced crop movement has probably had comparatively little direct effect on earnings. An improvement is not to be looked for in July, but there may be one in August on some roads.

There is no great change in crop prospects reported. Heavy rains in June in California—unknown heretofore so late in the season—injured the wheat somewhat there, where it was nearly ready for harvest, but the crop remains a large one, and is now nearly all harvested, doubtless. The winter wheat harvest is also well advanced in most of the territory where much is grown except Michigan, this grain being produced pretty well to the south. Apparently nothing has happened to it since the last report except the usual vicissitudes of harvest weather, and most of it (except in Michigan) is beyond injury now. Uniformly favorable reports since

early spring seem to have led many to believe that there is a large crop of winter wheat. There is not—no prospect of an average crop even except on the Pacific Coast and in Kansas, where it is large. Too much of the crop was winter-killed to permit of a full crop, but the conditions have been generally favorable since, and doubtless the yield will be larger than was expected in April. Spring wheat is in an unusually good condition everywhere, and there is an unusually large acreage of it. It has still time to grow better or worse, but a large part of the dangers it encounters have now been safely passed. It is much earlier than last year.

The news is favorable for corn also, there being a good stand and a good start, and the plant being in condition to take full advantage of hot, growing July weather. With the start it has will require very unusual weather to spoil corn, and with the usual July and August heats and no great drought a full crop is almost certain, which will mean nearly 500 million bushels more than last year.

There has been a change in both directions in the cotton crop. East of the Mississippi, where it was in unusually good condition, excessive rains have done harm, especially by preventing cultivation; but west of the Mississippi, where a month ago the cotton was very backward and unpromising, having been deluged with rain, the weather has been very favorable, and the cotton, though probably not promising a full crop, is much improved.

It must be remembered that no crop is secure yet except winter wheat, and that this is not a large crop anywhere except in Kansas and on the Pacific coast, though in every important state it is better and generally much better than last year—Illinois, for instance, promising a crop of about 36 millions, which, to be sure, is a great decrease from the 61 millions produced in 1880, but a great increase over the 22 millions produced last year. As for the other chief crops, though spring wheat ripens much the soonest, probably corn has now the fewest risks to run, being much less likely to fail, and especially unlikely to after the start it has got, while a little bad weather may do a great deal of harm to wheat shortly before it ripens or during harvest. If there is average weather hereafter the wheat crop may be as large as, but probably somewhat less, than that of 1882, which is the largest so far; other small grains will probably be about the same as last year, that is, large; but the corn crop will probably be considerably larger than ever before, the largest heretofore having been 1,759 millions of bushels, in 1879. A large crop will be of very great advantage, and the probabilities are greatly in favor of our having one.

The address of Mr. Pierson before the Passenger Department of the Joint Executive Committee, at the meeting June 19, makes public some information not heretofore obtainable concerning the amount of the through travel from New York to the West. He gives the number of passengers carried on first-class tickets by the roads in the pool (including nearly all, as only the Lackawanna was outside of the pool, and it was not open until 1883, and carried very, very few through first-class passengers then) as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Chicago....	28,750	31,435	— 2,685	9.4
Points west of Chicago....	10,729	8,419	+ 2,310	22.5
Total....	39,479	39,854	— 375	0.9
St. Louis....	6,908	8,128	— 1,220	17.7
Points west of St. Louis....	2,553	2,707	— 154	6.0
Total....	9,461	10,835	— 1,374	14.5
Grand total....	48,940	50,089	— 1,749	3.5

The absolute amount of this through travel is in itself of great interest. It seems that on the average 134 persons daily bought first-class tickets from New York to Chicago or St. Louis and points beyond last year, and 139 in 1882—not enough to occupy all the seats in

those sold to Chicago only, as tickets are bought to points beyond for passengers going no further than Chicago for the sake of the reduction, the coupon for the line west of Chicago being sold separately. As the cuts *via* Chicago were not met, or not always met, by the lines *via* St Louis, it is almost certain that a part of the change in sales *via* Chicago, probably the larger part, and possibly the whole of it, was due to this. The Chicago travel, it is seen decreased a little; but the St. Louis travel decreased more than one-seventh, which could not have been due to natural causes.

The average number of passengers daily from New York to Chicago was 109 in 1882 and 108 in 1883; to St. Louis, 30 in 1882 and 26 in 1883. Of this number 23 in 1882 and 29½ in 1883 were ticketed to points beyond Chicago; 7½ in 1882 and 7 in 1883 to points beyond St. Louis.

These figures seem very small, as many connected with the passenger business do; but it must be remembered that the passenger business is not by any means so concentrated as the freight business. Thus the through passengers from New York to Chicago are doubtless a very much smaller proportion of the whole number of passengers out of New York than the New York-Chicago freight is of the total freight. If we had all the travel from New York to competitive points out of Chicago and St. Louis, for instance, it would doubtless be so much greater, in value as well as in numbers, than this Chicago and St. Louis travel as to make the latter appear trifling.

Our large table of earnings in May, published last week, had reports from 71 roads, with 50,642 miles of road, and showed, with an increase of 8.8 per cent. in mileage, an increase of only 5 per cent. in total earnings, and a decrease of 2.8 per cent. in earnings per mile. The aggregate gains and losses of all the roads reporting from month to month this year have been:

Miles reporting.	Inc. or Dec.	P. c.	— Per mile.	Inc. or Dec.	P. c.
Jan. 50,570	— \$28,237	0.1	— \$45	9.1	
Feb. 49,935	+ 883,740	4.2	— 23	5.0	
March ... 55,361	+ 1,133,398	3.7	— 65	10.8	
April ... 50,855	+ 2,657,124	10.5	— 8	1.5	
May ... 50,642	+ 1,454,721	5.0	— 16	2.8	

The aggregate increase was 45 per cent. less in May than in April, but it is much better than was done in previous months. A decrease of 2½ per cent. in gross earnings per mile is not a very important matter when so large a part of the mileage is new. Last year, however, the roads reporting showed a decrease of earnings also, at the rate of 2½ per cent. As is usual when earnings begin to be unfavorable, some railroads cease to report. Twelve roads reported for May last year that have not reported this year. Some of these report regularly, but too late for this table; but we no longer get regular reports from the Wabash or any of the Southwestern system (though we have the latter occasionally), nor from the Hoosac Tunnel & Western, the Buffalo, New York & Philadelphia, the Central of Georgia, the Denver & Rio Grande, the Hannibal & St. Joseph, the Lake Erie & Western, the Ohio Southern, or the Toledo, Cincinnati & St. Louis, all of which were in our May table last year.

For the five months ending with May, the 71 roads and 50,238 miles reporting showed an increase of 3.7 per cent. of earnings made with an increase of 8.7 in mileage, and a decrease in earnings per mile from \$2,708 to \$2,585, or 4.6 per cent. In 1883 79 roads, with 56,083 miles, showed an increase of 0.7 per cent. in earnings per mile over 1882, which was a very unfavorable year for many roads.

The three Iowa roads, leased by the Illinois Central have been exceptionally unprogressive, and only the eastern 143 miles, which is the outlet of the other two, has what can be considered respectable earnings, though the 183½ miles from Iowa Falls to Sioux City has been open for 14 years, and for most of this time had the field pretty much to itself, and the 75½ miles from Waterloo north to the Minnesota line has also been open 14 years, and runs through a pretty well peopled country. Attention is called to the smallness of their earnings by the report for June, which gives them separately for each road. Their earnings per mile then were:

D. & S. C.	I. F. & S. C.	C. F. & Minn.
1884 \$467	\$2,1	\$110
1883 647	335	163

This year was a very unfavorable one, it is true, but on the other hand, last year was a very favorable one. Very few railroads in the United States (that make reports) have earnings so small as the Cedar Falls & Minnesota reports for last June. Yet it might easily have happened that this would have become a section in an important through line between Chicago and St. Paul, which was probably anticipated when the road was built; though by depending on the Milwaukee & St. Paul for the St. Paul connection the possibility of it was abandoned, as that company had its own lines

to Lake Michigan. It brings the Illinois Central within 118 miles of St. Paul at a point 374 miles from Chicago, making a route much shorter than that of the Rock Island and the Burlington, Cedar Rapids & Northern, which latter passes quite near to the whole length of the Illinois Central's Cedar Falls & Minnesota Branch. It seems remarkable that the Illinois Central should have been so long so near the rapidly growing traffic centre at St. Paul and Minneapolis without going there, which might have transformed the line which earned \$110 last June into one earning seven or eight times as much; and if the whole of the line from Chicago *via* Dubuque to the Minnesota line had been owned by a single company, in all probability it would have done so long ago. But this line until recently was owned by four different interests, and is still by three. The 38 miles of the Chicago end belong to the Chicago, Burlington & Quincy. The Chicago & Iowa, which has been but a short time controlled by the Burlington, owns the 80 miles thence to Forreston; only the 83 miles thence to Dubuque are owned by the Illinois Central, and the remaining 178 miles it leases for a percentage of its gross earnings, which is so large that it is not certain that a through traffic, such as a St. Paul connection would bring, would yield profit enough to pay the rent. With the example before us of the success of the Rock Island in getting a large share of this traffic over a longer line, it seems altogether probable that a Chicago-St. Paul line *via* Dubuque and the Illinois Central would have made good profits for somebody.

The tenth annual report of the English Railway Commissioners has recently come to hand. By far the most noticeable case is the one standing first on the list. The Broughton & Plas Power Coal Company against the Great Western Railway Company. The decision was rendered more than a year ago, but has hardly attracted the attention it deserves. It really goes farther in the direction of a *pro rata* system of rates for different distances than almost any one in this country, except a few professed agitators, would venture. The complainants shipped coal from North Wales to Birkenhead. The distance was from 27 to 36 miles, the rates from 5s. to 2s. 5d. per ton. The same railroad carried coal from South Wales to Birkenhead and charged 6s. a ton, the average distance being 156 miles. It was claimed that this was unjust discrimination; the whole charge being based upon the fact that the profit per mile of the short distance was greater than the profit per mile of the long distance. The Commissioners were not prepared to go as far as this, and dismissed the complaint, but in stating their reasons for so doing, they took ground which is scarcely less dangerous. We quote their own words:

"The decision of the Court of Appeal in the Denaby case establishes beyond doubt that if goods of the same kind are carried to the same destination over the same railway for distances that are not the same, and the gross charge from the intermediate point is the same as from the more distant one, there is a preference of one traffic over another which is *prima facie* an undue preference within the meaning of the act of 1854, and that it is not sufficient to rebut this presumption to show that the charge for the longer distance has been reduced to meet competition from another route."

And the same presumption would obviously arise if the charge for the longer distance, though actually more was not so to an amount sufficient to cover the cost of the extra services. . . . Neither would it be sufficient in our opinion that these two items should exactly balance each other. . . ."

This practically amounts to saying that railroads must make more profit on their competitive shipments than on their non-competitive ones—not more in proportion to the rate, but more in the aggregate on each shipment. We occasionally hear it urged that they ought to make as much on the one as on the other; but when they are told that they must make more on the competitive business we are carried back to the palmy days of Granger legislation. How the Commissioners expect to enforce the doctrine remains to be seen. It calls for an amount of Christian virtue on the part of freight agents which we can hardly expect in this wicked world. The attitude of the Commissioners in this matter reminds us of a sermon delivered a generation ago by the master of a boys' school: "Blessed are the pure in heart. Mind that, boys. The Bible says it's your duty to be pure in heart. If you're not pure in heart I'll flog you."

Erie Earnings and Expenses in May.

The Erie report for May compares with the first month of its lease of the New York, Pennsylvania & Ohio Railroad. Compared with last year it shows a decrease of 21½ per cent. in gross and 53 per cent. in net earnings (less rental of the Ohio road both years). The statement of the earnings on the Erie proper shows that last year there was a *profit* of \$54,186 on the lease and this year a *loss* of \$47,205, and for the eight months ending with May this year there has been a loss of \$274,083 on the lease.

The gross and net earnings and working expenses of the

Erie proper for the month of May have been, for the seven years since the reorganization:

	Gross earnings.	Expenses.	Net earnings.
1878	\$1,172,961	\$819,482	\$353,479
1879	1,330,474	1,064,680	285,787
1880	1,592,544	972,436	620,108
1881	1,776,890	1,076,925	600,965
1882	1,681,798	1,020,439	652,350
1883	1,669,174	1,083,305	576,869
1884	1,308,545	966,768	341,777

The gross earnings were thus the smallest since 1878, and 26 per cent. less than in 1881, when they were largest. The working expenses were also the smallest since 1878, the decrease for last year being 10½ per cent. The net earnings were larger than in 1878 and 1879, but smaller than in any other year, not half as great as in 1881, and 40 per cent. less than 1st year.

The available profits, as we have said before, were less this year and larger last year than these net earnings, by reason of the loss and profit on the leased Ohio road.

For the eight months ending with May the gross earnings of the Erie proper were \$1,430,871 (11 per cent.) less than last year. The working expenses were \$767,897 (8½ per cent.) less, and there was a decrease of \$662,974 (17 per cent.) in the net earnings. As there was a profit of \$54,187 on the lease last year (it had lasted but one month then), and as there was a loss of \$274,083 on it this year, the decrease in the total profits of the Erie Company available for paying interest, etc., is \$991,244, which is about double the dividend paid on the preferred stock from last year's profits.

For the eight months ending with May the Erie's earnings and expenses have been, for seven years:

Year.	Gross earnings.	Expenses.	Net earnings.
1877-78	\$10,731,514	\$7,514,617	\$3,186,897
1878-79	10,812,394	7,763,012	3,049,342
1879-80	12,403,673	7,982,561	4,421,122
1880-81	14,006,816	9,144,126	4,932,690
1881-82	13,118,45	9,042,401	4,075,844
1882-83	13,043,339	9,119,834	3,933,505
1883-84	11,612,468	8,341,937	3,270,531

The gross and net earnings are the smallest since 1879, the expenses the smallest since 1880. The decrease in net earnings is 31 per cent. since 1881, when they were largest. Adding the profit on the lease last year and subtracting the loss this year, we have \$3,987,692 as the Erie's profit in 1883, and \$2,986,448 this year, which latter is \$1,956,242 (39½ per cent.) less than the net earnings in 1881, and less even than they were in 1878 and 1879.

The Erie's net earnings were \$97,572 less in May than April, but more than in any previous month of this year. The net earnings plus the profit or loss on the New York, Pennsylvania & Ohio lease in each of the 13 months of the lease have been:

May, 1883	\$631,055	December, 1883	\$220,342
June, 1883	615,722	January, 1884	85,773
July, 1883	616,773	February, 1884	238,221
August, 1883	1,100,065	March, 1884	212,617
September, 1883	1,037,413	April, 1884	39,465
October, 1883	84,308	May, 1884	294,572
November, 1883	703,079		

For the first three months of the lease the profits with the Ohio road did not differ much from those of the previous without it, but were a little less; in August, September and October, however, the profits were extraordinary, especially in August and September—nearly the same for those three months as they have been for the eight months ending with May. In November the profits were about what they had been in previous years; but then there was a sudden and great decrease, which has lasted ever since. In the six months ending with May the profits have been but \$1,450,001—not as much as in September and October, and but 32 per cent. more than in the single month of August last. The contrast between the figures in the two columns is very striking.

Chicago through and local shipments of flour, grain and provisions eastward by the imperfect report to the Board of Trade were 39,773 tons in the week ending July 5, against 21,037 tons in the corresponding week last year and 59,364 in the previous week of this year, thus showing a decrease of 19,591 tons (33½ per cent.) from the previous week, which is probably due to the advance in rates from 15 to 20 cents June 24. The shipments are still very large for the season, however.

For six successive weeks the reported shipments and the percentages going by each road have been:

Tons:	May 31.	June 7.	June 14.	June 21.	June 28.	July 5.
Flour	5,922	6,999	5,106	6,759	5,874	6,63
Grain	37,905	34,782	43,146	38,104	41,900	25,820
Provisions	8,391	9,534	7,925	8,172	11,764	7,781
Total	52,118	50,615	56,177	53,033	50,364	30,773
Per cent.:						
C. & Grand T	15.0	18.4	13.2	16.0	14.5	16.3
Mich. & En.	12.9	11.4	11.4	12.9	13.4	9.6
Lake Shore	18.1	14.5	15.0	11.2	12.1	12.3
Nickel Plate	10.8	8.1	11.6	10.5	11.1	9.1
F. Wayne	16.3	17.2	13.7	15.2	15.9	16.7
C. St. L & P	9.1	7.5	7.7	10.5	9.6	11.5
Balt. & Ohio	9.3	12.3	13.3	12.5	7.2	10.2
Ch. & Atlant.	8.5	10.6	12.1	11.2	16.2	14.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Of the entire decrease of 19,591 tons last week from the previous week, no less than 16,080 tons were grain, which is the only traffic except flour which the lake vessels take much of. The provision shipments were not much less than usual, though much (33 per cent.) less than the week before, when doubtless stocks were hurried forward to take advantage of the rate. The flour shipments were above the average. What is most noticeable in the distribution of the shipments is the very small share going by the Michigan Central. The three Vanderbilt roads together took 31 per cent. of the whole, while the Chicago & Atlantic and the Grand Trunk together took nearly the same (30.6 per cent.); and

the two Pennsylvania roads 28.2. The advance in rates makes the distribution of some importance. Under the 15 cent rate it was assumed that the cost equalled the receipts, and so roads were not required to make good what they carried over their proportions.

It is hardly to be hoped, perhaps, that the shipments will keep up to last week's rate through July; but the fact that another advance is announced for July 21 is likely to prevent the holding back of shipments, so that what freight there is will probably come forward freely. The vessels would take a much larger share of the grain if the exports were large; but by far the larger part goes to interior points for consumption, and most of this will go by rail at current rates or higher ones.

The Mobile & Ohio Railroad Company makes a preliminary partly estimated statement of its earnings and expenses for the fiscal year ending with June, which compares as follows with that of the year before:

	1883-'84.	1882-'83.	Inc. or Dec.	P. c.
Gross earnings.....	\$2,72,786	\$2,271,058	+\$1,728	0.7
Expenses.....	1,654,637	1,642,652	-\$8,015	5.4
Net earnings.....	\$718,149	\$628,106	+\$89,743	14.3

The gain of one seventh in net earnings was thus due almost entirely to the reduction in working expenses, which were 68.4 per cent. of the earnings last year and 72.3 the year before.

The crops of the South were so much poorer last year than the year before that it is remarkable that the gross earnings should have kept up so well. The completion of the New Orleans & Northeastern has introduced a new competitor for some of the through traffic, but probably has had little effect on this road, because it has but a small part of the New Orleans traffic. The gross earnings of the Mobile & Ohio have not varied greatly since the reorganization in 1879, but the net earnings have varied considerably. They have been:

1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.
Gross....\$2,284,615	\$2,377,817	\$2,164,284	\$2,271,058	\$2,272,786
Net....824,966	815,331	562,129	630,034	718,149

The obligatory interest is \$456,000, but there are outstanding \$8,650,000 of debentures, of four different classes, interest on which is payable, if earned, at the rate of 7 per cent. The first preferred debentures amount to \$5,300,000, requiring \$271,000 for interest. They have received this only once, in 1881, when 2 per cent. was paid on the second incomes also. In 1882 the first preferred received 2 per cent., and in 1883 3 per cent. This year the surplus over first mortgage interest is estimated to be \$202,000, which is a little less than 5 per cent. on the first preferred debentures.

This is the oldest road from the Ohio Valley to the Gulf, having been opened in 1859, and it seems remarkable that in the 25th year of its existence its net earnings should be less than 6 per cent. on a capital of only \$26,325 per mile—including only the mortgage bonds and the first debentures. The other debentures amount to \$3,350,000, and there is \$5,320,600 of capital stock, but the control of the road is in the debentures so long as they are unpaid, the stock being voted by trustees who take their instructions from a vote of the debentures. Thus the control is exercised by those who have an immediate interest in the profits of the road.

A correspondent asks what is the most practical way of arriving at the proper sizes for culverts on a new railroad line, and says the subject seems to have been neglected in engineering publications.

An old practical rule on this subject, for which good authority can be given, is: "Estimate the largest possible area of opening that seems to be required, and then multiply by two." Another, in more scientific form, but perhaps no greater practical value, is:

Area of opening in sq. ft. = $c \sqrt{\text{drainage area in acres}}$, c being a coefficient which varies with the topography. The author of the formula, Maj. E. T. D. Myers, recommends $c = 1.0$ as a minimum in flat country, 1.6 in hilly, compact ground and 4.0 as a maximum in mountainous, rocky country. If any reader knows of other or better guides than these we shall be glad to hear from him.

George Alfred Townsend has been disseminating misinformation concerning the United States railroad system, evidently not having looked up the easily accessible information. He informs us, in last Sunday's *New York Tribune*, there are now "perhaps 100,000 miles," while at the beginning of this year there was a little more than 120,000 miles. This system, he says, "has cost perhaps \$500,000,000." At his reckoning of the mileage this would be \$5,000 per mile; while a year ago the reported cost of 112,412 miles reporting was \$5,930,400,000, or \$52,750 per mile; but as if to make up for the error on this side by exaggeration on another, he puts the number of locomotives in the country at 38,000, and says "a friend at Long Branch" told him they were worth "not less than \$10,000 apiece, and more nearly \$15,000." Poor's Manual last year found 22,114 locomotives, and, though there are many locomotives that have cost more than \$10,000, the average will have to be put very much below that, in view of the very large number of light and antiquated ones still in use. So we can hardly agree with "Gath's" conclusion that "the railroads in the United States have cost not far from \$500,000,000," and still less that "the locomotives cover four-fifths of that amount"—namely, of the cost of the railroads. The locomotives may have cost \$175,000,000, which is about one-thirty-fourth of the cost of the railroads—not four-fifths.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Boston, Winthrop & Shore.—Completed from Point Shirley, Mass., to Point of Pines, 7 miles; also a branch from Crescent Beach to Revere Junction, 0½ mile.

Chicago & Northwestern.—The *Princeton & Western Branch* is completed from Necedah Junction, Wis., east to Necedah, 16 miles.

Cornwall & Mt. Hope.—Track laid from Cornwall, Pa., southward to Mt. Hope, 4 miles.

Fargo Southern.—Completed by laying track from Graceville, Minn., northward, 48 miles.

Lehigh Valley.—A branch has been completed from the main line near Three Bridges, N. J., to Flemington, 3 miles.

Louisville, New Orleans & Texas.—Extended from Hariston, Miss., southward 22 miles, completing the gap between New Orleans and Vicksburg.

Northern Pacific.—The leased *St. Paul & Northern Pacific* road is extended from Sauk Rapids, Minn., southeast to Minneapolis, 65 miles.

Saginaw, Tuscola & Huron.—Extended from Sebewaing, Mich., northeast to Bayport, 12 miles. Gauge 3 ft.

St. Louis, Fort Scott & Wichita.—Extended from Wichita, Kan., west to Clearwater, 21 miles.

Union Pacific.—The track of the *Georgetown Branch, Colorado Division*, is extended from Silver Plume, Col., to Graymount, 4 miles. Gauge, 3 ft.

This is a total of 202½ miles of new railroad, making 1,416 miles reported to date for the current year. The total track reported laid to the corresponding date for 12 years past is as follows:

Miles.	Miles.
1884.....1,416	1873.....791
1885.....2,391	1877.....710
1882.....4,758	1876.....846
1881.....2,418	1875.....457
1880.....2,228	1874.....727
1879.....1,035	1873.....1,587

These statements include *main track only*, no account being taken of second tracks or other additional tracks of sidings.

Foreign Railroad Notes.

The roads of the German Railroad Union have had an increase in their total passenger traffic in every year but since 1876; but there was some increase in mileage, and from 1876 to 1879 there was a constant decrease in the travel per mile, amounting to about 8 per cent.; but since 1879 there has been a constant increase, making the traffic per mile 8% per cent. greater in 1882 than in 1879, and about the same as in 1876. This travel is at the rate of 177,704 journeys yearly over the entire mileage, which is equal to 243½ persons each way daily.

The Prussian Minister of Public Works reports that there have been many complaints that cars that had been disinfected with chloride of lime or carbonic acid, even when used long afterward and when apparently entirely from the odor of these disinfectants, have imparted the smell to such freights as coffee, flour and rice, and greatly reduced their value. In one case hogs carried in car which had been disinfected with chloride of lime had been poisoned by the chlorine that was given out, and in another hunting dogs lost their sense of smell for a time. To avoid this in future the government railroad directories are instructed to avoid the use of these disinfectants, and to use exclusively hot steam and hot water in connection with a hot alkaline solution or lye.

Notes at the Missouri Pacific Shops.

The principal shops of this enormous system of railroads are situated at St. Louis, and are of but moderate size, and in fact the machine and erecting shop was built some fourteen years ago for the original Missouri Pacific Railroad, and has not been enlarged since. In a system covering so large a territory, the different divisions have a somewhat independent organization, the various shops being each capable of executing some repairs, and as all extensive repairs are not executed at one central point, the principal shops are not as large as might be expected. The whole Missouri Pacific system, though embracing some 6,000 miles of line, has only 733 locomotives, and the St. Louis shop virtually serves as headquarters for about one-third of this mileage and a corresponding number of engines, or only a few more than are employed on the Manhattan Elevated Railroad in New York, working but 32 miles of road.

The good organization of the shops enables them not only

to keep the engines in repair, but to execute a large amount of work outside the usual run of locomotive building.

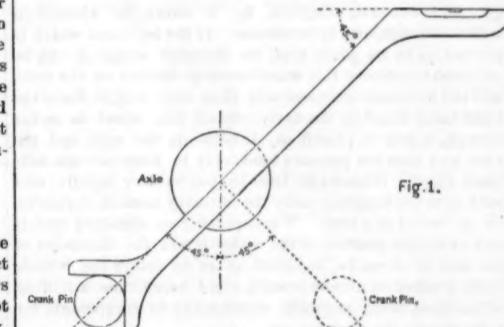
Smith's hearts, drill presses, etc., are made here quite extensively as a regular article of manufacture, and are supplied to the various shops along the line.

The system of making the various parts of an engine to a standard by means of a liberal use of templates, gauges, reamers, etc., is comparatively easily carried out by a firm which makes only new engines, and does not execute any repairs, but becomes a work of constant difficulty in a railroad shop where the engines of half-a-dozen different makers have to be kept in repair. Even where such engines are made from the same drawings, and are nominally alike in all particulars, it will be found that they are built from gauges and templates which differ just sufficiently to prevent the parts of an engine by one maker from being interchanged with corresponding parts of an engine built by another maker. A master mechanic has constantly to struggle against this difficulty, which delays and enhances the cost of locomotive repairs. The collection of reamers, cut-

ters, special taps and numerous other appliances for repairing the various parts of locomotives, and keeping them to a standard size, is usually complete in the Missouri Pacific shops, and a few of these devices are described further on.

The proper size of the crank-pins in the wheel-fit is ascertained by a couple of ingenious and accurate little contrivances. The hole in the wheel is gauged by means of an adjustable gauge, set out against the walls of the crank-pin hole by means of right and left handed thumb-screws. The gauge when set is drawn out of the hole, and callipered at each end by a pair of differential callipers. These callipers can be set by means of thumb-screws, but in order to secure greater fineness of adjustment a small plunger works through one foot of the callipers, and serves as a touch-piece. Thus the size of the object is the distance between the face of this touch piece and the other leg of the callipers. The touch-piece is connected to the short arm of a bell-crank lever, the long arm of which is a needle moving on a scale cut on the callipers near the head. Each division in this scale is equivalent to $\frac{1}{100}$ in. diameter of crank-pin. It was found by experiment that a crank-pin $\frac{1}{100}$ in. larger in diameter than the hole would remain tight during service, while a greater difference in size tended to burst the hub, and of course a smaller difference was insufficient to keep the pin firmly in the wheel. It was therefore obviously desirable that every crank-pin should be $\frac{1}{100}$ of an inch larger in diameter in the wheel-seat than the hole in the wheel. As the crank-pin holes in engines made from the same drawings, but by different makers will differ considerably more than $\frac{1}{100}$ in., it was evidently necessary to provide for holes of different diameters and tapers. This is effected by the adjustable gauge, which takes the exact form of the hole. When it is withdrawn, the exact diameter within $\frac{1}{100}$ in. at each end can be ascertained, and read off on the scale. The turner then has only to turn the pin $\frac{1}{100}$ in. larger, using the same callipers, and as the callipers are not sprung over the pin, but the touch-piece is lightly kept in contact by a small spiral spring, and the size can be plainly read off on a scale, there is no guessing, and no difference can arise from a variation in the force with which the callipers are pressed against the work. It will be noticed that the scale does not give the full dimension, or indeed any positive size, but merely the fractional parts or differences in size, which is important to know. Thus, on calibrating the gauge when it is withdrawn from the crank-pin hole, the index finger may stand at 6. It is not necessary to know whether the diameter of the hole is 3.70 in. or 3.80 in.; all the turner has to do is to turn the pin so that the index reads 14 instead of 6. He can then be certain that, whatever the diameter of the hole, the pin is $\frac{1}{100}$ in. larger, and this is all that is practically required.

Another very useful little contrivance has been in use for some years for readily ascertaining whether the crank-pins on an engine are at right angles to one another. It often happens that after the engine has been running some time the axle becomes twisted, and consequently the crank-pins are no longer at 90 degrees apart, though originally correctly set in a quartering machine. The little tool (shown in fig. 1) enables the accuracy of the pins to be tested. The



wheel, being placed with the crank downward, the right-angle fork at the lower end of the gauge is put on the crank-pin, and the inclined face is brought into a line with the centre of the axle. The instrument being clamped to the wheel, the latter is turned until the bubble in the spirit level stands central. It is obvious then that the line joining the centres of the crank-pin and axle is inclined at an angle of 45 degrees with the vertical centre line of the axle. The instrument is now unclamped and set on the other crank-pin. If the bubble in the spirit level again stands central, it is evident that the line joining the centres of this crank-pin and the axle is also at an angle of 45 degrees from the vertical; and that the sum of these angles being 90 degrees, the crank-pins are correctly at right angles to one another. If the bubble stands away from the axle, the crank-pins are less than 90 degrees apart, and if the angle between them is too great the bubble will stand toward the axle.

Stow's flexible shaft drills are an exceedingly useful and convenient appliance in a locomotive repair shop, and it is somewhat surprising that they are not more generally used. They are usually driven from the main shafting, but Mr. Leroy Bartlett, the Master Mechanic at St. Louis, has gone a step further and gets the power for truing crank-pins, reborning cylinders in place, and drilling any odd holes required by an engine under repairs, by means of small portable three-cylinder engines of the Brotherhood type. The engine has three $\frac{3}{4}$ -in. cylinders, and is mounted on wheels so that it can be readily moved about the shop. It is driven by compressed air, furnished by three old Westinghouse air pumps that are past regular ser-

vice on the road. They deliver into old engine reservoirs from which air mains are laid through the shops. The main pipes have branches provided with globe valves and nozzles to which rubber air hose can be attached. The portable engine being brought near the locomotive under repair, the hose and Stow flexible shaft are coupled up, the air turned on, and the work proceeds. Suitable gearing provided with proper sockets can be used between the engine and flexible shaft, so as to obtain the proper speed. In this way a repair job can be done at night without keeping the stationary engine and main shaft running. The boilers will generally furnish enough steam to keep the pumps going, or the pump of a live engine in the round-house can be utilized. This method of obtaining power would appear to be very convenient, especially in small remote round-houses without any stationary engine or boiler. As at present arranged, when an engine comes in needing some small repair requiring a little turning and drilling few holes, the work must be done by hand, though the boiler of the engine containing 60 or 70 lbs. of steam all night would afford ample power for the purpose, could it be properly utilized. The use of a small three-cylinder engine, driven by compressed air, appears to be a cheap and convenient method of getting over the difficulty. Of course steam can be used for driving the engine, but its heat course, affects the hose, and the condensation and exhaust might be somewhat inconvenient.

A variety of special reamers and cutters are used for standard parts of engines. Thus one set of cutters is made of the proper shape for making the seat of the pop valves, which can thus be very readily trued up, and all remain the same diameter and taper. The mud plugs are also all tapped to the same taper by an attachment to an ordinary turret lathe for brass work. The taper hob on the lathe spindle gives the correct pitch, but the screw-cutting arm being unsupported by the shears of the lathe, as in cutting a parallel screw, is apt to spring unless steadied in some way. A small tapered piece is therefore laid down on the shears, and the arm bearing on it is thus supported at both ends, and cannot spring. Of course the taper of the hob and the taper of the packing piece on the lathe bed must be arranged to correspond, so that each performs its share of the work.

The wheel press is arranged to put on both wheels simultaneously, thus effecting some saving in time. With this method of working it often happens that when one wheel is pressed up to its place, the other has still some distance to

during their lifetime. The whole of the main part of the hearth, including slack trough, is made in one casting, the back alone being separate. This makes a very substantial job, there being nothing to get loose.

The air-valves for their hearths are also made in the St. Louis shops, a simple brass slide-valve kept against its face when shut by the pressure of the air.

The bolts used are all made to standard gauges for diameter and taper, and no measuring diameters of bolts is allowed. An erector orders the bolts he wants by giving length and number, and the men at the bolt lathes are not permitted to go down to the engine and calliper the holes. Sets of cast-iron blocks having reamed holes of different sizes to the standard taper are used with male gauges, and a plate with accurately bored holes is kept locked up and used only to test the accuracy of the gauges. The reamers when worn too small for one size are ground down to the next.

The taps are backed off by an eccentric motion, which gives a reciprocating action to the slide rest, withdrawing the tool from the tap as the cutting edge of each groove comes round, the motion being of course geared to correspond with the number of grooves in the tap. Coal oil is used as a lubricant in tapping cast-iron, being found better than lard oil.

The driving brasses are forced into the axle boxes by 20 tons hydraulic pressure. A small vertical hydraulic press is used for this and similar work. This is found to be far preferable to the old plan of driving the brasses in with a sledge hammer.

The floor of the machine shop is laid with oak planks nailed to stringers, the whole floor resting on sand rammed down firmly. To judge from the condition of the floor, which is remarkably level and even and appears to have needed no repairs, this method gives excellent results.

A small jib and a small traveling crane are used in the machine shop for lifting work in and out of the heavier machines, but the engines are still lifted by jacks.

The machine shop is lit by four arc lamps, both lamps and dynamos being made at the works. Mr. Leroy Bartlett, the Master Mechanic, has carried out an extensive series of experiments on dynamos and has at length achieved some very satisfactory results.

TECHNICAL.

Locomotive Building.

Mr. A. J. Pitkin, for two years past Mechanical Engineer of the Schenectady Locomotive Works in Schenectady, N. Y., took charge of those works as Superintendent on July 1, having been chosen to that office by the trustees.

The Portland Co. in Portland, Me., has been building some locomotives for the Eastern Railroad, and has some work on hand.

Car Notes.

The Ohio Falls Car Co., in Jeffersonville, Ind., has recently turned out an elegant new Woodruff parlor car for the route between Chicago and Louisville.

The Detroit, Grand Haven & Milwaukee shops in Detroit are building one passenger car, one baggage car, one caboose and a number of freight cars for the road. The passenger car contains several new improvements.

The Wason Manufacturing Co. at Brightwood (Springfield), Mass., is now finishing four passenger cars for the Lehigh Valley road; two for the Old Colony road; 10 open passenger cars for the Panama Railroad; one passenger car and 50 freight cars for the Meriden & Cromwell road. An order was recently received for two 60-ft. baggage cars for the Maine Central road.

Four parlor cars were recently received by the Boston & Providence Co. from the Barney & Smith Manufacturing Co. in Dayton, O. They are to run on the Shore Line between Boston & New York.

Iron Notes.

Mingo Furnace at Mingo, O., has gone out of blast, and it is not known when it will resume work.

Powery Furnace, of the Cumberland Coal & Iron Co., was sold at sheriff's sale in Cumberland, Md., June 18, and was bought for the account of the creditors for \$100. The incumbrances on the property are about \$100,000. It is thought that some basis of settlement will be reached by which the company will regain control of the furnace.

Hannah Furnace, belonging to the Mahoning Iron Co., near Youngstown, O., has gone into blast.

Strothman Bros., proprietors of the Standard Iron Works at Minneapolis, have added a small rolling mill to their works.

The Rorer Iron Co. at Roanoke, Va., has been organized under a new charter recently obtained, the officers of the company being F. Rorer, of Roanoke, President, and J. H. Sykes, Secretary and Treasurer.

The Lynchburg Iron Co. is rebuilding its works near Lynchburg, Va., and increasing their capacity.

The Hartman Steel Co. is enlarging the capacity of its works at Beaver Falls, Pa. The chief products of the company are steel wire and steel nails.

The Pennsylvania Steel Co., at Steelton, Pa., has given notice of a reduction of 10 per cent. in wages, to take effect Aug. 14. It is understood that the company has taken several contracts for steel rails at a very low price in order to keep the mills going, and that this is the principal cause for the reduction, which has generally been accepted by the workmen.

Manufacturing Notes.

The Union Switch & Signal Co. in Pittsburgh has received an order from the Chicago, Burlington & Quincy Co. to equip five points in the Chicago yards with the pneumatic signal switch.

The Union Iron Works in San Francisco has taken a contract to build a steel steamer for the Newport Coal Co. This steamer is to be 207 ft. long, 30 ft. beam, and 16 ft. depth of hold. She is intended to carry one thousand tons of coal, with a draft of 12½ ft. She will have compound engines, with 24 and 48 in. cylinders of 38 in. stroke.

Messrs. Fairbanks, Morse & Co., of Chicago, have contracted with the Westinghouse Machine Co., of Pittsburgh, to control the entire sale of the Westinghouse automatic engines in the Western states and territories for a term of years. This contract, which is exclusive, takes effect July 1, and has been closed after a full and thorough investigation as to the relative merit of different styles of engines, the decision of the Chicago firm being in favor of the Westinghouse.

The firms of Caughey & Robinson, and of Bell & Orr, of

Pittsburgh, have been dissolved. The new partnership of Robinson & Orr succeeds them, and will deal in rolling-stock, rails, etc., continuing the business of the old firms.

The Ajax Metal Co. has removed its main office to the works, No. 2040 North Tenth street, in Philadelphia. A branch office is retained with Messrs. Philip S. Justice & Co., at No. 14 North Fifth street in the same city.

The Rail Market.

Steel Rails.—Business is very dull and no large orders are reported. Quotations for small lots are from \$31 to \$31.50 per ton at mill, but larger lots could be placed without difficulty at \$30, and it is even reported that this figure has been shaded a little in order to secure orders.

Rail Fastenings.—Quotations continue unchanged at \$2.35 per 100 lbs. for spikes in Pittsburgh; \$2.50 to \$2.75 for track bolts, and 1.70 to 1.75 cents per lb. for splice bars. The demand is light and prices weak, and orders could be placed without difficulty at something below these figures.

Electric Locomotive Headlights.

It is stated that the Chicago, Milwaukee & St. Paul Co. has decided to substitute the electric light for oil in its locomotive headlights. The company will also experiment in the use of the electric light in the illumination of passenger cars. The changes will be made as fast as the apparatus can be made and put into place.

The St. John Bridge.

The St. John (N. B.) Telegraph of July 7 gives the following account of the new cantilever bridge over the St. John River at that city:

"The steel cantilever railway bridge across the river at the falls is now so far advanced that a description of the structure and the railway extension through Portland will be of interest. The bridge and approaches are being built by the St. John Bridge & Railway Extension Co. Hon. Thos. R. Jones is President, and takes a lively interest in the progress of this important enterprise. The Dominion Bridge Co., of Montreal, is the contractor for the erection and building of the bridge. Its representative here is Mr. F. E. Came; the foreman is Mr. M. H. Hasler. Mr. M. J. Hogan, of Quebec, has the contract for grading the extension and the masonry work of the main bridge as well as of the overhead bridges on the line through Portland. His interests are looked after by Mr. W. Marrian. Exercising a general supervision over the entire work is Mr. P. S. Archibald, Chief Engineer of the Intercolonial Railway. His assistant is Mr. Gillmour Brown.

"As before stated, the bridge is of the steel cantilever principle, the weight of the span being supported by enormous masses of iron in the anchorages on either side. The western cantilever is 381 ft. 6 in. long, the eastern 286 ft. 2 in., the intermediate or connecting span being 143 ft. 1 in. At the anchorage of the western cantilever the height of the superstructure is 28 ft., the height of the truss over the pier being 80 ft. The centre span is 28 ft. in height. The truss over the eastern pier is 64 ft. high, and the superstructure over the anchorage the same as on the western tank. Accommodation is only given for one track on the bridge, which is 20 ft. in width. The structure when completed will resemble the bridge recently built across the Niagara, with the exception that while the latter is a deck bridge, the one across the St. John is what is termed a through bridge—that is, the truss-work is above the track level instead of underneath as at Niagara. From low water mark the height of the structure is 94 ft. (8 in. higher than the present suspension bridge); high water, 72 ft."

"Nothing but the best of material will enter into the construction of the bridge, which will be built entirely of German steel, some of the bolts being of wrought iron. In about two weeks the erection of the bridge itself will be commenced. The steel is rolled in Germany, England and Scotland, and delivered at Montreal, where it is now being manufactured into sections to be shipped to St. John as fast as required. The western cantilever will be shipped by Grand Trunk, Maine Central and New Brunswick Railway; the eastern cantilever by the Intercolonial. As the extension through Portland is not completed the western sections will be brought down and first placed in position. It is estimated that under the weight of a heavy freight train the central span will not deflect more than 2 in. The bridge will be held together by steel pin connections. The bridge will be painted with anti-corrosive paint, the compression members of dark red and the tension members of a lighter color.

"The piers are now finished. The western anchorage is about half completed, and excavations are now being rapidly pushed forward for the eastern anchorage. The foundations for the trestle on the west side of the bridge are completed, and work is now being rapidly projected on the trestle where the junction is made with the New Brunswick Railway track. This trestle will be of steel, 450 ft. in length, composed of 60 and 30 ft. spans. At the highest point it is 62 ft. from the ground. It is founded on stone pedestals. The scaffolding to the level of the trestle was commenced on Friday. The immense iron beams of the west end anchorage, which are to support the cantilever on that side, are now in position. Considerable blasting remains to be done before the eastern anchorage will be ready.

"Starting at low water line the foundations of the eastern pier have been blasted out of the solid rock, the dimensions on the bottom being 32 by 15 ft. It runs up 91 ft. with a batter of 2 in. in every 3 ft., the area on the top being 28 by 9 ft. The western pier is founded on the side of the cliff at a point about 35 ft. above high water mark, and also rests on solid rock. This pier rises to a height of 51 ft. to a level with the other pier, its area on top and bottom being the same, and the batter of course somewhat heavier. The piers are 477 ft. apart, which represents the clear span of the bridge. They are built of granite, quarried at Eagle Rock, which was brought down the New Brunswick Railway to the siding, near the asylum, and transported by teams to the sites of the piers where the immense blocks were lowered into place by very large derricks worked by horse-power. The stones are laid in regular courses of an average thickness of 2 ft., the best of English Portland cement mortar being employed. Some idea of the strength of the granite may be formed by the estimate of the Assistant Engineer, Mr. Brown, who states that the eastern pier could be built up to a height of about one mile in the air before the bottom stones would be crushed by the enormous weight.

"The extension through Portland is something over a mile in length. Commencing at the Intercolonial wharf, York Point slip, the road crosses Fisher's pond, the public slip, Long wharf, St. Helena wharf to Acadia street. There has been constructed 900 ft. of trestle work across these ponds, composed of 40 and 21 ft. spans. At Long wharf and St. Helena wharf piles 45 ft. long have been driven down through the wharves into the mud. These piles are capped with red pine timbers and stringers. Acadia street is crossed at right angles, and from this point to the crossing of Straight Shore road, west of Chesley's foundry, extends an earthen embankment 43 ft. high at the highest point, and containing 80,000 cubic yards of earth. Simonds street is crossed by a 25 ft. span overhead bridge of iron with stone

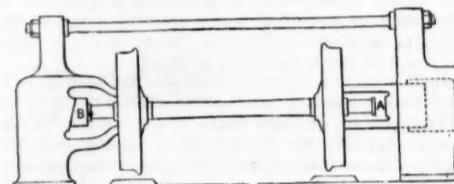


Fig. 2

go. The annexed diagram, fig. 2, shows the method in which this difficulty is overcome. If the left-hand wheel is pressed up to its place first, the movable wedge *B* can be adjusted to prevent the wheel moving further on the axle, and the hydraulic pressure will then only tend to force the right-hand wheel on similarly; should this wheel be on far enough, a liner is placed at *A*, between the axle and the rim, and then the pressure tends only to force on the left-hand wheel. Wheels can thus be put on very rapidly, and with as much accuracy as by the ordinary method of putting on one wheel at a time. When putting on standard wheels and axles, the position of the wedge *B* and the thickness of the liner at *A* can be adjusted, so as to insure the wheels being pressed on almost exactly right every time, a trifling adjustment being requisite occasionally to compensate for roughness in the castings, etc.

The twisted wire for lead car seats is made on a machine which twists the wire and cuts it off to length. About 500 lbs. of twisted wire is turned out per month. The lead seats are cast, ten at a time, in a species of bullet mould, the cores of the holes being formed by two long wires running the length of the mould.

The brass foundry flues are kept separate for each crucible until they ultimately deliver into the main vertical chimney. The brickwork of this chimney is supported on an iron girder placed some 6 ft. above the floor of the brass foundry, and therefore above the action of any excessive heat. The bricks below the girder can therefore be replaced or repaired without disturbing the chimney above. The furnaces for heating the crucibles are each distinct, and the fire-brick lining is contained in a separate cast-iron casing for each furnace, the casing standing on cast-iron pillars. The air can therefore freely circulate round the casing, and any one furnace can be readily repaired without disturbing its neighbor. The grates are furnished with a shaking arrangement which can be operated from the floor of the foundry, without descending into the ash-pit. Cleaning holes are provided for both horizontal and vertical flues. All the car brasses are babbited, a very necessary precaution, many of the cars having short journals, considerably smaller than the M. C. B. standard.

Substantial cast-iron smiths' hearths are made here for the different shops of the company. As these hearths can be very quickly erected and moved whenever some rearrangement of the shop is thought desirable, they present many advantages, and occupy less room than a hearth composed wholly of brick, and if properly proportioned and well lined, are quite as durable, and require fewer repairs

abutments. This bridge has not yet been erected. An overhead bridge, span 40 ft., traverses the Hilyard crossing. It is also of iron with stone abutments, one of the abutments finished, the other in course of erection."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Louisville, New Orleans & Texas, special meeting in New Orleans, July 22, to complete the organization of the company.

Mobile & Girard, annual meeting, in Girard, Ala., July 24.

Manhattan, adjourned special meeting, at the office in New York, Aug. 1.

Metropolitan Elevated, special meeting, at the office in New York, July 31.

New York Elevated, adjourned special meeting, at the office in New York, Aug. 1.

Poughkeepsie & Southwestern, annual meeting, at No. 97 Nassau street, New York, Aug. 20, at noon.

St. Paul, Minneapolis & Manitoba, annual meeting, in St. Paul, Minn., Aug. 15.

Vicksburg & Meridian, adjourned annual meeting, at the office in New York, July 16, at noon.

Dividends.

Dividends have been declared as follows:

Atchison, Topeka & Santa Fe, 1½ per cent., quarterly, payable Aug. 15, to stockholders of record on July 11.

Canadian Pacific, 2½ per cent., semi-annual, payable Aug. 18. This is made up of the 1½ per cent. guaranteed by the Canadian government and 1 per cent. supplementary by the company.

East Pennsylvania (leased to *Philadelphia & Reading*), 3 per cent., semi-annual, payable July 15.

Minnehaha & Schuylkill Haven, 3½ per cent., semi-annual, payable July 15.

Mobile & Ohio, 5 per cent. on the first-preferred income and sinking fund debentures for the year ending June 30, payable 2½ per cent. Aug. 1 and 2½ per cent. Feb. 1, 1885.

St. Paul, Minneapolis & Manitoba, 2 per cent., quarterly, payable Aug. 1. Transfer books close July 19.

Wilmington, Columbia & Augusta, 3 per cent., semi-annual, payable July 10.

Wilmington & Weldon, 4 per cent., semi-annual, payable July 15.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

General Baggage Agents' Association, semi-annual meeting, in Boston, on Wednesday, July 16.

Traveling Passenger Agents' Association, annual meeting, in D-nver, Col., on Tuesday, Aug. 12.

Western Association of General Passenger & Ticket Agents, adjourned meeting, in Minneapolis, Minn., on Wednesday, Aug. 13.

Train Dispatchers' Association, preliminary meeting, to form an association, in Louisville, Ky., on Wednesday, Aug. 20.

Master Car-Painters' Association, annual convention, in Boston, on Wednesday, Sept. 3.

Road-Masters' Association of America, annual convention, in Indianapolis, Ind., on Wednesday, Sept. 10.

Association of American Railroad Superintendents, semi-annual meeting, in Boston, on Tuesday, Sept. 16.

National Association of General Passenger & Ticket Agents, semi-annual convention, in Boston, on Tuesday, Sept. 16.

New England Railroad Club, first monthly meeting for the season, at the rooms in the Boston & Albany station in Boston, on Wednesday, Sept. 24.

New England Road-Masters' Association, annual convention, at White River Junction, Vt., on Wednesday, Oct. 8.

General Time Convention, fall meeting, at the Continental Hotel, Philadelphia, on Thursday, Oct. 9.

Southern Time Convention, fall meeting, at No. 46 Bond street, New York, on Wednesday, Oct. 15.

American Street Railway Association, annual convention, in New York, on Wednesday, Oct. 15.

Foreclosure Sales.

The sale of the *Austin & Northwestern* road which was to have taken place July 2, has been again adjourned until Nov. 5 next, at Austin, Texas.

General Baggage Agents' Association.

Mr. M. B. Starring, Secretary, has issued the following circular, dated Chicago, June 16, 1884:

"Allow me to call your attention to the fact that in the semi-annual convention of the National Association of General Baggage Agents will be held the third Wednesday in July, i.e., July 16, 1884, at Boston, Mass., meeting to be called at 2 P. M. The Committee of Arrangements, Messrs. Morton, Pease and Towle, advise me that they have made arrangements with the management of the Quincy House for your accommodation at the rate of \$2.50 per day. It is very much to be desired that you be present personally, and we trust that you will co-operate with us actively in inducing such of your connections as are not yet members, to join this Association. Many important subjects will be brought up for discussion at this meeting, and we would like to have each and every line represented, in order that each may present his own views on the question raised. That the necessary rooms may be reserved for you, will you have the kindness to notify me on or before July 9, 1884, if your line will be represented at this meeting."

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—Dr. W. T. Barnard has been appointed to the position of Assistant to Mr. Robert Garrett, First Vice-President of the company. Dr. Barnard has been for several years Secretary of the Baltimore & Ohio Employers' Relief Association.

Boston & Lowell.—The following circular announces officially an appointment heretofore noted:

"Mr. James K. Taylor is appointed Superintendent of Rolling Stock and Machinery, with headquarters at Concord, N. H., taking effect June 23."

Boston, Winthrop & Shore.—The following appointments have recently been made: W. D. Love, of Boston, General Passenger and Freight Agent; E. B. McMichael, of East Boston, Road-master.

Central Pacific.—At the annual meeting in San Francisco, July 8, the following directors were chosen: Leland Stanford, C. F. Huntington, Charles Crocker, C. F. Crocker, Timothy Hopkins, W. V. Huntington. The board re-elected Leland Stanford, President; C. F. Huntington, First Vice-President; Charles Crocker, Second Vice-President; E. H. Miller, Jr., Secretary; Timothy Hopkins, Treasurer.

Chicago, Burlington & Quincy.—Mr. Wm. J. Fabian has been appointed Acting Paymaster in place of T. M. Garrett, resigned.

Chicago, Milwaukee & St. Paul.—Mr. A. J. Earling has been appointed Assistant General Superintendent of this road, succeeding Mr. H. C. Atkins, deceased.

Chicago, St. Paul, Minneapolis & Omaha.—Mr. S. G. Strickland has been appointed General Agent representing this company and the Chicago & Northwest Railway in Manitoba and the Northwest Territory, since F. W. Cusack, resigned, with office in Winnipeg. This appointment took effect July 1, 1884.

Columbia & Greenville.—Mr. J. S. Land has been appointed Master of Trains.

Denver & Rio Grande.—On application of the bondholders the United States Circuit Court has appointed W. S. Jackson Receiver of this road. Mr. Jackson is a banker of Colorado Springs.

Grand Trunk.—General Manager Joseph Hickson has issued the following circular: "Mr. W. J. Spicer having accepted the position of General Manager of the Chicago & Grand Trunk Railway, Mr. James Stephenson has been appointed Superintendent of the Grand Trunk Division of the railway, with headquarters at Montreal. Mr. William Edgar, heretofore Assistant General Passenger Agent, succeeds Mr. Stephenson as General Passenger Agent. Mr. John Burton has been appointed Assistant to the General Manager, and Mr. Alfred J. Read, Assistant Treasurer of this company. These appointments take effect July 1, 1884."

Louisville & Nashville.—The following circular from the office of the President, Mr. Milton H. Smith, is dated Louisville, June 30: "Mr. B. Dunham having resigned as General Manager, Mr. J. T. Harahan, General Superintendent, is appointed General Manager, taking effect July 1."

Mr. Harahan has been on the road for many years, working his way up from the lowest position to the charge of the most important divisions of the line.

Louisville, New Albany & Chicago.—Mr. Theodore L. Dunn has been appointed General Superintendent of this company, vice Mr. John MacLeod, resigned, and will have headquarters at Chicago. Mr. Dunn was recently on the Hannibal & St. Joseph.

Maryland Central.—At a meeting held in Baltimore, July 7, the following directors were chosen: George S. Brown, Oliver C. Zell, W. W. Spence, Joseph W. Jenkins, Sr., Hugh B. Jones, Michael Jenkins, James F. McCabo.

Massachusetts & North Mountain.—At a meeting held in Harrisonburg, Va., June 25, a temporary organization was effected by the election of the following officers: Henry C. Allen, Chairman, and Frank King, Secretary.

Millsap & Mineral Wells.—At a meeting held in Mineral Wells, Tex., June 28, the following officers were elected: Dr. C. C. Raines, President; M. Milligan, Vice-President; J. Castles, Treasurer; C. B. Wilcox, Secretary; W. L. Garrett, Corresponding Secretary; Wm. S. Hitson, J. B. Pollard, R. W. Duke, J. M. Parish, C. B. Raines, J. R. Robinson, G. W. McCafferty, directors.

Ogdensburg & Lake Champlain.—The following officers for this road have been elected by the new board: President, Lansing Mills; Treasurer, H. A. Church; Secretary, Geo. T. Childs; Executive Committee, L. Mills, J. Gregory Smith, J. R. Langdon, W. A. Haskell, S. A. Carlton; Road and Property Committee, D. W. Lawrence, Timo. Hoyle, J. W. Hobart.

Old Colony Railroad Benefit Association.—At the annual meeting in Boston, July 7, this association elected the following officers for the ensuing year: Directors, J. C. Sanborn, George T. Taylor, H. G. Burnham, D. F. Desmond, E. A. Fisher, G. W. Wilson, G. W. Holbrook, F. Whitten, A. O. Brown, C. F. Russell, P. W. Jackson, G. W. Wilde, R. E. Danas; trustees, George W. Wilde, S. C. Putnam, S. C. Sanborn; auditors, C. F. Hammond, G. W. Holbrook, E. A. Fisher.

St. Joseph & Southeastern.—The following directors have been elected for this new company: John W. Baily, O. A. Sandusky, Wm. B. Johnson, Chas. McGuire, James W. Boyd, John S. Logan, M. F. Posegate, St. Joseph, Mo.; J. A. C. Robinson, D. W. Clouser, Perry W. Noland, Halleck, Mo.; G. W. Ray, Dearborn, Mo.; Kemp M. Woods, Jr., James M. Bernard, Smithville, Missouri.

St. Louis, Fort Scott & Wichita.—Mr. A. L. Hopkins has been chosen President of this company and D. S. H. Smith Treasurer. Both are officers of the Missouri Pacific.

Schenectady Locomotive Works.—At a meeting of the trustees, held July 1, Mr. Albert J. Pitkin was chosen Superintendent. He has been Mechanical Engineer of the works for two years past.

Southern Pacific.—At the annual meeting in San Francisco, July 9, the old directors were re-elected. The board subsequently re-elected Charles Crocker President; Charles F. Crocker, Vice-President.

Walkill Valley.—Edward F. Winslow, President, announced the following list of officers of this road on June 30: J. E. Childs, General Superintendent, 24 State Street, New York; Geo. H. Graves, Superintendent, Kingston, N. Y.; John B. Kerr, Attorney, 35 Wall Street, New York; E. J. Winslow, Auditor, 24 State Street, New York; J. C. Anderson, General Freight and Passenger Agent, 24 State Street, New York; E. Minshull, Master Mechanic, Middletown, N. Y.; J. McQueen, Car Accountant, Middletown, N. Y.; I. W. Fowler, Paymaster and Purchasing Agent, Middletown, N. Y. These officers are the same as those of the New York, Ontario & Western.

PERSONAL.

It is reported that Mr. James McCoy, late of the Baltimore & Ohio, will succeed Mr. Merrill as Superintendent of the Western Division of the New York, West Shore & Buffalo road.

Mr. Charles E. Pugh, General Manager of the Pennsylvania Railroad, was married to Miss Clara Jaggars, of Altoona, Pa., June 26. A number of officers of the company were present.

Mr. Chas. D'W. Gibson, until lately President of the Cliff & Righter Co., and now President of the Marden Car Brake Co., has been appointed General Agent for Messrs. A. French & Co., of Pittsburgh.

Mr. Augustus Bauer, for some time draftsman for the Chicago, Burlington & Quincy shops at Aurora, Ill., but for some years with the Atchison, Topeka & Santa Fe, at Topeka, has been appointed mechanical engineer of the street cable railroads in San Francisco.

Mr. J. D. Browne, having resigned his position as Master Mechanic of the Vicksburg & Meridian road, the employees of the Vicksburg shops recently presented him with a handsome silver service. Mr. Browne has been connected with the road for 16 years.

It is reported that Mr. C. B. Meeker, General Passenger Agent of the New York Central & Hudson River road, will shortly resign his position on account of continued ill-health. This report has been circulated several times before, but Mr. Meeker still continues to perform the duties of his office.

Mr. Bradford Dunham has resigned his position as General Manager of the Louisville & Nashville road and will go back to the Baltimore & Ohio which he left only a few months ago to go to the Louisville & Nashville. It is said that his new position will be that of Assistant to the President.

Mr. Charles G. Fairman, of Elmira, N. Y., died at Wellsboro, Pa., July 6, aged 49 years. Mr. Fairman was for several years editor of the Elmira Daily Advertiser, and also held several political positions, having been for three years Superintendent of the Insurance Department of the state of New York. Mr. Fairman was at one time largely interested in the Utica, Ithaca & Elmira and the Cazenovia & Canastota roads.

Reports which have been current that the presidency of the Union Pacific Co. had been offered to Mr. Hugh Riddle are positively contradicted on the authority of that gentleman. Mr. Riddle retired from the management of the Rock Island road because his health was such that he could not devote his whole time to the affairs of the company, and he would certainly not be willing to undertake the management of any other road, especially one requiring such close attention and hard work as the Union Pacific.

Mr. W. R. McGill, President of the Cincinnati & Eastern Co., was instantly killed on the afternoon of June 2. He was riding on train on his road, and as the train crossed a trestle near Winchester, O., he stood in the door of the baggage car looking out. A sudden lurch of the car threw him out and he fell down to the ground, a distance of nearly 50 feet. Mr. McGill was a resident of Newton, O., where he was well known and had been connected with the Cincinnati & Eastern from its first commencement.

TRAFFIC AND EARNINGS.

Railroad Earnings. Earnings for various periods are reported as follows:

Six months ending June 30:

	1884.	1883.	Inc. or Dec.	P. c.
Bur., C. R. & No.	\$1,278,774	\$1,280,856	D. \$2,112	0.2
Canadian Pacific	2,192,703	2,226,661	D. 31,958	1.5
Central Iowa	666,086	577,84	I. 89,162	15.4
Chi. & Alton	3,859,084	3,805,578	I. 53,506	1.8
Chi. & East. Ill.	698,400	787,307	D. 88,907	11.3
Chi., Mil. & St. P.	10,428,00	10,688,936	D. 260,938	2.4
Chi. & Nor'west	10,570,520	10,888,850	D. 318,330	2.9
Chi., St. P. & M.	2,654,219	2,364,047	I. 290,172	12.3
Chi. & W. Mich.	764,741	754,031	I. 10,710	1.4
Florida Ry. & N.	518,791	441,022	I. 77,769	17.6
Ill. Central	4,807,646	4,999,666	D. 162,030	3.2
Iowa lines	792,023	930,527	D. 137,604	14.8
Little Rock, F. S.	225,388	242,934	D. 17,546	7.2
& Texas	154,330	185,287	D. 30,957	16.7
Long Island	1,127,655	1,092,815	I. 34,240	3.1
Louisv. & Nash.	6,564,571	6,375,382	I. 189,180	3.0
Mo. Pacific	7,635,318	7,570,549	D. 64,768	0.9
Mobile & Ohio	972,155	963,146	D. 9,000	0.9
No. Pacific	5,938,248	5,531,060	I. 240,188	68.2
Roch. & Pitts.	518,003	210,210	I. 307,793	146.4
St. L. & San Fr.	2,118,065	1,697,018	I. 421,947	24.9
St. P. & Duluth	495,734	512,098	D. 16,364	3.2
St. P., M. & Man.	3,657,518	3,912,542	D. 255,024	6.5

Five months ending May 31:

Atch. T. & S. F.	\$6,392,786	\$6,107,909	I. \$284,877	4.7
Net earnings	3,083,444	3,018,542	I. 64,902	2.1
Chi. Bur. & Q.	9,538,839	9,462,287	I. 76,552	0.8
Net earnings	4,146,239	4,436,859	D. 290,630	6.6
Cleve., Col., Cin.	1,457,527	1,642,144	D. 184,617	11.2
Chi. & N. Eng.	5,223,886	5,284,677	I. 239,200	4.5
Chi., L. Erie & W.	1,860,192	2,005,627	D. 145,435	7.3
Chi., N. Eng.	9,901,944	8,109,917	D. 207,973	2.5
Chi., N. & Eng.				

Grain Movement.

For the week ending June 28 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year	western receipts	Total	P. c.	Atlantic.
1877	1,930,151	2,416,415	557,394	23.1
1878	3,006,503	3,039,650	826,301	27.0
1879	3,779,476	3,829,431	1,236,651	32.3
1880	5,117,800	6,025,682	1,709,241	28.4
1881	7,649,571	6,559,673	2,542,753	40.6
1882	2,310,613	2,481,707	727,250	29.3
1883	3,604,292	2,467,851	1,027,074	29.6
1884	3,772,170	4,868,603	2,580,358	53.0

Thus the receipts of the Northwestern markets for the week this year were larger than in the corresponding weeks of 1883 and 1882, but not half as great as in 1881 and smaller also than in 1880 and 1879. They were 314,000 bushels less than in the previous week and were the smallest for five weeks.

The shipments of these markets were larger than in the corresponding of any previous years except 1880 and 1881, and were 1,401,000 bushels more than last year, but were 201,000 bushels less than in the previous week of this year, and the smallest for four weeks. Of the shipments 155,767 bushels went down the Mississippi. The rail shipments were larger than in any corresponding week and but 218,000 bushels less than in the previous week, though the advance of 5 per cent. over 100 lbs. in the rail rate took place June 24.

The Atlantic receipts for the week were larger than in the corresponding week of last year and the year before, and exceeded only in 1880 and 1881, when, however, they were 152 per cent. and 90 per cent. more than this year. The Atlantic receipts were also 258,000 bushels more than the week before and the largest of the year.

Exports from Atlantic ports for this week to June 28 for four years have been:

	1880	1881	1882	1883	1884
Flour, bbls.	90,218	104,782	105,001	135,181	162,659
Grain, bu.	7,370,803	4,358,466	1,327,192	2,505,451	1,910,328

The exports this year were the smallest for five weeks.

Coal.

Anthracite coal tonnage for the six months, ending June 28, as given by the weekly reports of the companies, were as follows, the tonnage in each case being only that originating on the line to which it is credited:

	1884.	1883.	Inc. or Dec.	P. c.
Phila. & Reading	4,202,985	5,547,210	D. 1,324,225	23.7
No. Cent., Shaw, Div.	464,548	590,025	D. 125,477	21.3
Sun., Hazelton & W. B.	142,390	67,355	L. 75,035	111.4
North & West Branch	441,934	248,424	L. 193,510	77.9
Pennsylvania Canal	143,669	166,652	D. 16,983	10.5
Penn. & N. Y.	97,795	97,392	L. 403	0.4
Lehigh Valley	2,655,157	2,804,159	D. 149,052	5.3
Del. Lack. & West.	2,211,680	2,219,023	D. 7,343	0.3
Del. & Hud. Canal Co.	1,644,648	1,768,555	D. 123,907	7.0
Penn Coal Co.	550,506	623,921	D. 73,415	11.8
State Line & Sullivan	42,572	29,927	L. 12,645	42.2

Total anthracite... 12,657,834 14,106,643 D. 1,538,809 10.8

New Jersey Central tonnage is included in the Reading for both years, to complete the comparison.

The total tonnage by these reports to the corresponding date for eight years past has been as follows:

Tons.	Tons.	Tons.	Tons.
1884	12,657,834	1880	10,321,876
1883	14,106,643	1879	12,033,908
1882	12,749,929	1878	7,212,663
1881	12,577,083	1877	9,915,120

The tonnage for the six months, after several months of restriction, has been brought down very nearly to a level with that of 1882 and 1881. There has not been the increase which was looked for in the demand, especially for Western trade.

Bituminous tonnages for the six months ending June 28 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Barclay R. & Coal Co.	162,377	153,656	L. 8,721	5.7
Huntingdon & Broad Top	94,344	97,627	D. 3,283	3.4
Cumberland, all lines	1,287,077	1,095,837	L. 191,840	17.5
Bellefonte & Snow Shoe	92,544	121,177	D. 28,633	23.7
Kearney & Karthaus	12,579	12,579	L. 12,579	0.0
Cleared	1,510,882	1,293,710	L. 141,172	10.3
Mountain District Pa. R. R.	187,692	223,765	D. 36,073	16.1
West Penna. R. R.	142,350	224,427	D. 82,077	36.6
Southwest Penna. R. R.	75,724	54,602	L. 21,122	38.4
Penn. & Westmoreland	101,188	114,194	D. 13,006	11.4
Monongahela Dis., Pa. R. R.	24,527	251,095	D. 30,336	14.5
Pittsburgh Dis., Pa. R. R.	140,238			

Total bituminous... 4,384,341 4,272,168 I. 112,173 2.4

Bituminous tonnages for the most part continue to show gains over last year, though there is a failing off in some of the smaller districts.

Coke tonnages for the six months ending June 28 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Bellefonte & Snow Shoe	11,126	10,362	I. 764	7.3
Mountain District, Pa. R. R.	63,207	49,903	L. 15,304	30.6
West Penna. R. R.	24,686	53,083	D. 28,397	53.6
Southwest Penna. R. R.	1,110,040	1,011,794	L. 98,246	9.7
Penn. & Westmoreland	101,188	114,194	D. 13,006	11.4
Monongahela Dis., Pa. R. R.	41,703	454	L. 41,249	0.0
Pittsburgh	177,380	306,264	D. 123,884	42.1

Total coke... 1,531,330 1,546,054 D. 14,724 0.9

These tonnages are all over the Pennsylvania Railroad and its branches. Some of the changes are due to changes in form of reports and are thus only apparent.

The coal tonnage of the Pennsylvania Railroad Division of the Pennsylvania Railroad, for the six months ending June 28 was as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Coal	4,915,125	4,294,946	I. 620,177	14.4
Coke	1,516,404	1,646,054	D. 29,177	1.4

Total... 6,432,002 5,841,000 L. 501,002 10.1

This includes the total tonnage carried both from mines on the line of the road and that received from other lines. The increase was entirely in coal, the coke shipments showing a slight decrease, chiefly due to diversion of tonnage to new competing lines.

Actual tonnage passing over the Pennsylvania & New York road for the seven months of its fiscal year, from Dec. 1 to June 28, was:

	1884.	1883.	Increase.	P. c.
Anthracite	684,206	610,536	43,670	0.8
Bituminous	192,244	191,513	731	0.4

Total... 876,50 832,049 44,401 5.3

The larger part of the anthracite is received from the Lehigh Valley road, of which this road is an extension.

Cumberland coal shipments for the week ending July 5 were 53,566 tons. The total shipments this year to July 5 were 1,341,182 tons, against 1,150,548 tons to the corresponding date last year, showing an increase of 190,636 tons, or 16.8 per cent.

The Flat Top Coal Co. has made several extensive leases of coal property in the Flat Top region in Mercer County, W. Va., to operators who are going to work at once. The leases are all on a royalty of 12½ cents per ton of coal. The new mines will be reached by an extension of the New River

Division of the Norfolk & Western road about four miles along Bluestone River.

It is stated that the Erie and the Rochester & Pittsburgh have reached an agreement for the division of bituminous coal tonnage. Rates to Buffalo are fixed by the agreement at \$1.40 per ton, and to Rochester at \$1.50 per ton.

Lake Superior Iron Ore.

Shipments of ore by water from the Lake Superior region up to July 2 are reported by the Marquette Mining Journal as follows:

	1884.	1883.	Increase.	P. c.
L'Anse	22,681	12,521	10,169	81.2
Marquette	268,283	116,927	151,356	129.4
Escanaba	602,185	362,723	239,462	66.0
St. Ignace	18,319	—	—	—

Total... 911,468 492,171 419,297 85.2

Of the Escanaba shipments this year 232,995 tons were from the Marquette District and 398,790 tons from the Menominee District. Of the Marquette shipments, 236,433 tons came over the Marquette, Houghton & Ontonagon and 31,850 tons over the Marquette & Western roads. Besides the lake shipments, 10,306 tons of ore are reported hauled to local furnaces. The total shipments of pig iron this year have been 2,075 tons.

Rates to Upper Mississippi Points.

A meeting was held in Chicago June 29, at which were present representatives of the Illinois Central, the Chicago & Northwestern, the St. Paul, and the Central Iowa roads and the Diamond Joe steamboat line. After a long discussion in which the troubles which have been for sometime affecting the competitive business to points on the upper Mississippi River it was finally agreed to restore rates and to adopt the old spring tariff. This will go into effect July 7, the steamboat line being allowed the same differentials as formerly. This disposes of a question which has caused a great deal of trouble and much cutting of rates for some two months past.

Lumber Rates.

A meeting of the North & South Lines Lumber Association was held at the Grand Pacific Hotel in Chicago, July 1. After some discussion it was agreed to reaffirm rates on lumber as shown in the tariff adopted Dec. 1 last, to take effect immediately.

Western Trunk Lines' Association.

A meeting of the Western Trunk Lines' Association was held in Chicago, July 1, and much routine business was disposed of, as it was the first meeting held in some time. No business of much general importance was brought up or acted upon.

Cotton.

Cotton movement for the week ending July 4 is reported as follows, in bales:

Interior markets:	1884.	1883.	Inc. or Dec.	P. c.
Receipts	5,229	4,367	I. 855	19.5
Shipments	7,257	9,629	D. 2,372	24.7
Stock, July 4	37,523	74,647	D. 37,124	49.5

Seaports:

term of the Court. In the meantime, the preliminary restraining order of the Court will remain in force until a hearing and final decision.

Boston, Winthrop & Shore.—This company has recently completed its line from Point Shirley, Mass., to Point of Pines, a distance of about seven miles, with a branch one-half mile long, running from Crescent Beach to a connection with the Eastern Railroad at Revere Junction. The road was opened July 1 from Point Shirley to Crescent Beach, and trains will run to Point of Pines about July 18. In connection with its road the company runs a steamboat from Boston to Point Shirley, having purchased the steamer "Baltimore," a propeller with a capacity for 500 passengers. The steamer connects with trains for all points on the line, the steamboat trip from Boston being about $4\frac{1}{2}$ miles. The road is opening with a good business, which is constantly increasing. Its travel will be largely summer pleasure travel to the sea beaches along the line of the road.

Buffalo, New York & Philadelphia.—A report was telegraphed this week to the effect that a strike was about to take place in the shops of this company at Buffalo and on the road, owing to the company's failure to pay wages at the usual time. The Treasurer of the company denies absolutely the report, and says that there is no probability of a strike from this cause, as all pay rolls up to June have been paid promptly, and the June payment will begin on July 15, the usual time.

Camden & Atlantic.—Work is to be begun at once on the extension of the second track from Haddonfield, N. J., to Lakeside Park, about 10 miles. The intention is to extend this second track through to Atlantic City, but only a portion of the work will be done this year.

Chicago & Batavia.—This company has filed articles of incorporation to build a railroad from Chicago to Batavia in Kane County, Ill., about 35 miles. The capital stock is to be \$800,000, and the principal office is in Chicago.

Chicago, Burlington & Quincy.—The earnings of this company's lines for May and the five months to May 31 were as follows :

	May.	1884.	1883.	Five months.
Earnings.....	\$1,982,127	\$2,009,872	\$0,538,839	\$9,467,287
Expenses.....	1,158,498	1,128,116	5,392,610	5,030,428
Net earnings....	\$822,629	\$881,756	\$4,146,220	\$4,436,850

Per cent. of exps. 58.5 56.1 56.5 53.1

The gross earnings for the five months show an increase of \$71,552, or 0.8 per cent. This gain is accompanied by an increase in expenses of \$362,182, or 7.2 per cent., the result being a decrease of \$290,630, or 6.6 per cent., in net earnings.

Chicago & Eastern Illinois.—The final decree in the old suit of Fosdick and Fish, trustees, against the Chicago, Danville & Vincennes Co., the ending of which was briefly noted last week, was made by the United States Circuit Court in Chicago, in pursuance of the rulings of the Supreme Court of the United States. The Court finds that the equities in the case are against all the defendants except the Chicago & Eastern Illinois Railroad Co., in whose favor are the equities in its cross-bill against all the defendants in the suit. The cross-bills of Ewell, as trustee, and of Roberts, as trustee, are dismissed with costs. There is found to be due to Fosdick and Fish by the Chicago, Danville & Vincennes Co., under the mortgage of 1869, the sum of \$4,795,417, and under the mortgage of 1872 the sum of \$2,908,296. The supplementary bill of the trustees is dismissed as to the Chicago & Eastern Illinois Co., upon whose cross-bill this decree was based. The Court decides that by the original deed of the master in chancery, dated April 16, 1877, to Huidekoper, Shannon and Dennison, and the confirmation thereof, and the subsequent conveyances made by them to the Chicago & Eastern Illinois Co., that company acquired a perfect and indefeasible title to the Illinois Division of the Chicago, Danville & Vincennes road, as described in the master's deed, free of all claims of the old company or any of its creditors or bondholders, who are by this decree perpetually enjoined from instituting any proceedings to disturb its title. Finally as Huidekoper, Shannon and Dennison, the original purchasers of the road, now decreed to be the property of the Chicago & Eastern Illinois Co., are the holders of all the bonds and coupons of the Chicago, Danville & Vincennes Co., except 172 bonds whose holders receive their full distributive shares, the decree in favor of the trustees is to be credited with the full amount paid by the purchasers at the sale with interest to this date. The petition of the National Bank of Ottawa for leave to intervene as the holders of certain second-mortgage bonds is dismissed. This decision finally closes the suits over the ownership of the road, and confirms absolutely the title of the Chicago & Eastern Illinois Co., to that part of its road which constitutes the original Chicago, Danville & Vincennes, ending long and vexatious litigation.

On July 3 a new bill in equity was filed in the United States Circuit Court in Chicago by C. C. Merriman, W. H. Stevens and others. The plaintiffs claim that they were judgment creditors of the old Chicago, Danville & Vincennes Co. to the amount of nearly \$150,000. They further claim that as they were not parties to the foreclosure suit they have a right to bring the present suit and charge that the officers of the old company made no resistance to the foreclosure because there was a fraudulent collusion between them and the parties who subsequently formed the Chicago & Eastern Illinois Co. The complainants ask that the decree of foreclosure may be set aside, and that they may be permitted to regain the property. They also ask that the present company be required to account for the earnings of its road, and be enjoined from issuing certain bonds, which it is charged are to be distributed for the officers of the old company in payment for their withdrawal of opposition to the final settlement of the foreclosure suit. It appears probable that the parties who brought this suit, and whose claims were cut off by the foreclosure, expect to secure something from the present company in order to prevent further litigation.

Chicago, Milwaukee & St. Paul.—The following statement is published, but as semi-official only; it is for the six months ending June 30 :

Gross earnings \$0,796,000

Expenses (5 per cent.) 5,387,800

Net earnings \$4,408,200

Income from other sources 150,000

Total \$4,558,200

Interest, six months 2,814,395

Surplus \$1,743,805

This is sufficient to pay 3½ per cent. on all the stock (\$47,445,244) and leave a balance of \$82,885 to credit of income account.

Chicago & Northwestern.—The Princeton & Western Division, an extension of the old Sheboygan & Fond du Lac road, is now completed and opened for business from Needad Junction, on the Chicago, St. Paul, Minneapolis & Omaha road, eastward to Needad, Wis., a distance of 16

miles. This line is to be extended from Needad eastward to the terminus of the old line at Princeton, a distance of about 50 miles.

Cleveland, Columbus, Cincinnati & Indianapolis.—The following statement for the quarter ending March 31 is published in London :

	1884.	1883.	Incl. or Dec.	P. c.
Earnings.....	\$896,900	\$1,000,736	D. \$103,896	10.4
Expenses	696,556	708,219	D. 11,663	1.6
Net earnings.....	\$200,344	\$292,517	D. \$92,173	31.5
Charges	201,811	155,812	I. 45,999	29.5
Surplus or deficit.....	... D. \$1,467	S. \$136,705

The expenses were 77.66 per cent. of gross earnings this year and 70.76 per cent. last year. The amounts expended for additions to property were \$68,170 this year and \$86,249 last year, making a total balance against income of \$67,637 this year.

Connotton Valley.—The time for the deposit of securities of this company under the reorganization agreement expired July 1. At that date over \$5,000,000 of the bonds and 85,000 shares of the stock had been deposited with the International Trust Co. of Boston, a sufficient amount of both to make the reorganization agreement binding under its terms. The committee will now push proceedings so as to secure the sale of the road as soon as possible.

Cornwall & Mount Hope.—The grading on this road is nearly finished from Cornwall, Pa., southward to Manheim, on the Reading & Columbia road, a distance of 9 miles. Rails are reported laid from Cornwall to Mount Hope, 4 miles, and it is expected that the whole road will be finished next month. It furnishes the Reading road with a connection with the large iron mines and furnaces in Cornwall.

Defaults in Interest.—The defaults in the July interest noted so far are eight in number. 1. California Southern, defaulted on its first mortgage bonds. 2. Denver & Rio Grande, defaulted on the consolidated bonds. 3. Mexican Central, coupons on the first-mortgage bonds funded by agreement with the bondholders, who, it is generally understood, will accept the company's offer. 4. New York & New England, coupons purchased but not paid directly by the company. 5. Philadelphia & Reading, coupons on the consolidated mortgage bonds purchased by Drexel & Co., and default made on the bonds subsequent to the consolidated issue. 6. Texas & Pacific, coupons purchased by the Missouri Pacific Co., not paid by the Texas & Pacific. 7. Washburn, St. Louis & Pacific, default made on the consolidated bonds and some other issues. 8. New York, West Shore & Buffalo, defaulted on the first mortgage bonds.

The Allegheny Valley Co. also made a temporary default on its first mortgage bonds, but this has since been made good.

Denver & Rio Grande.—An amended complaint has been filed in the United States Circuit Court at Salt Lake City in the suit against the Denver & Rio Grande Western Co. The new bill asks for the appointment of a receiver, and alleges that action is about to be taken for the appointment of a receiver for the Denver & Rio Grande in Colorado. The motion for a receivership was to be heard this week.

A dispatch from Salt Lake, June 28, says that the United States Circuit Court, in the suit between the two companies, has decided to continue the temporary injunction issued to restrain the Denver & Rio Grande Co. from interfering with Colonel Dodge in his management of the Rio Grande Western road under the provision of the lease. The Court sustained the lease, and refused to interfere with any of its provisions, on the ground that the contracting parties had a legal right to enter into the lease, and exercised this right in conformity with the law, and even if the lease had not been legally ratified the subsequent actions of the lessee in taking possession of the road had confirmed it. The Court further holds that Section 10, providing for the continuance of Colonel Dodge as Manager is not of such a character as would vitiate the lease, and that no sufficient proof had been brought forward to show that he had not been conducting the affairs of the road properly. The Court further holds that it has not been made to appear that the lease is in any way fraudulent, and that the proof as to the character of the property leased would seem to indicate that the lessee should have reserved to itself adequate means for protection, that it had done so did not vitiate the lease, and the fact that some directors in the Denver & Rio Grande Western Co. were also directors in the Denver & Rio Grande Co. was not sufficient to invalidate the lease.

On the receipt of this decision connection between the Denver & Rio Grande and its leased road was broken at the Colorado state line by the employees of the lessee company, who took up about a mile of track running from the state line eastward, thus effectively breaking all connection and preventing any transfer or exchange of business between the roads. The Western Co. has begun a new suit against the lessee, and has attached all the money belonging to it which is accessible.

A dispatch from Denver, July 8, states that application has been made by Woerishoffer & Co. and other New York bondholders to the United States Circuit Court for the appointment of a receiver for this company. It is stated that the movement has been made simply for the purpose of protecting the company and preventing vexatious suits, until some arrangements can be effected with the bondholders in regard to the recent default in interest. On July 9 the Court granted the application and appointed Mr. W. S. Jackson, of Colorado Springs, Receiver of the road.

Detroit, Bay City & Alpena.—This company expected to extend its road this year northward from its present terminus at Au Sable, Mich., to Alpena. It has been decided, however, that the present condition of business will not warrant the extension, and the road will have Au Sable for its northern terminus for this year at least.

Fargo Southern.—The last rail on this road was laid July 1, completing the line from Fargo, Dak., southward up the Red River Valley to Ortonville, Minn., where connection is made with the Hastings & Dakota Division of the Chicago, Milwaukee & St. Paul. The length of the road from Fargo to Ortonville is 120 miles, a little over half of it on the Dakota side of the line. The new road is understood to be independent, but it furnishes the Chicago, Milwaukee & St. Paul with a very convenient connection for Dakota business and probably most of its eastern business will be done over the St. Paul road. It runs nearly one north and south through very good country and may expect a considerable local traffic, although it will meet with competition at a number of points where it crosses the east and west lines. A large part of the capital has been furnished by parties who are stockholders in the Milwaukee & St. Paul, but it is claimed that there is no official connection between the two roads.

Georgia Pacific.—Work has been stopped on the extension of this road from Coatsburg, Ala., westward to meet the Columbus Division. It is understood that the difficulty of

obtaining money is the cause of the suspension, and that the work will be resumed as soon as possible.

Grafton & Greenbrier.—Arrangements are in progress for the extension of this road from its present terminus at Philippi, W. Va., up the Tygart Valley to Beverley, about 30 miles. A further extension to Cuttensville is also proposed. The road is now, it is understood, controlled by the Baltimore & Ohio.

Guatemala.—This road is now completed from the port of San Jose on the Pacific Coast to the City of Guatemala, a distance of about 70 miles. It has been under construction for several years and sections of the road have been in operation. It is owned by the government of the country.

Lake Shore & Michigan Southern.—The Court has refused to continue the temporary injunction against the renewal of the lease of the Jamestown & Franklin Railroad to this company, but has appointed a master to examine the accounts between the two companies and to report to the Court.

At a recent meeting of the directors of the Jamestown & Franklin Co. the General Counsel of the Lake Shore Co. was present and submitted three propositions on behalf of the Lake Shore : 1. That the Lake Shore should surrender the road and that it should be operated as an independent line. 2. That the Lake Shore Co. should operate the road as the agent of the Jamestown & Franklin Co., reporting the earnings and the expenditures at the end of each month. 3. That, in view of the present complications and the beginning of a suit to enjoin a new lease, the Lake Shore should consent to operate the road under the terms of the present lease until January, 1885. The third proposition was unanimously accepted by the Jamestown & Franklin board. It is stated that the trouble in connection with the renewing of the lease has been made by some of the minority stockholders who want the Lake Shore Co. to buy up their stock in order to prevent trouble.

Lehigh Valley.—This company has completed a branch line about three miles long from the main line of its New Jersey Division, near Three Bridges, N. J., to Flemington. The new line was opened for travel July 4.

Louisville & Nashville.—It is understood that a plan for the permanent financial relief of the company has been sent to Europe for the consideration of the foreign stockholders. The directors were to have had a meeting July 7 to consider this plan, but no quorum being present, an adjournment was taken until July 17. It is reported that the plan provides for the issue of debenture bonds to an amount sufficient to fund the floating debt.

The statement for May and the eleven months of the fiscal year from July 1 to May 31 is as follows:

	May	1884.	1883.	Eleven months.
Earnings	\$1,156,109	\$1,062,348	\$13,318,751	\$12,145,210
Expenses	681,33	583,230	8,185,712	7,467,512

Net earnings.. \$474,976 \$479,118 \$5,133,030 \$4,677,698

Per cent. of exps. 58.9 54.9 61.5 61.5

This shows for the eleven months an increase in gross earnings of \$1,173,541, or 9.7 per cent., an increase in expenses of \$718,200, or 9.6 per cent., and a resulting gain of \$455,341, or 9.7 per cent., in net earnings. Expenses have been somewhat increased this year by the floods in the Ohio and consequent interruptions to traffic.

Louisville, New Orleans & Texas.—Track is now laid all on the gap in the road south of Vicksburg, except at the bridge over the Homochitto River, which is not quite finished. It is expected that the bridge will be ready for use by the time the new road is ballasted and surfaced up, and that by July 15 trains can run through from New Orleans to Vicksburg, 235 miles.

On the gap north of Memphis work is being pushed as fast as possible. The track, as previously noted, has already been laid from Vicksburg north to Stoneboro, 80 miles, and from Memphis south to Clarksdale, 75 miles, leaving 60 miles still to be completed. A large part of the grading has been done, and work is progressing as fast as possible through a difficult country.

In New Orleans the track has been extended from its late terminus at the Broad street bridge on the south side of the Poydras street canal to the depot grounds.

Massanutton & North Mountain.—An organization of this company was completed at a meeting of the incorporators held in Harrisburg, Va., June 25. A committee was appointed to obtain proposals for the building and equipment of the line. The proposed route is from Strasburg, Va., on the Virginia Midland, to Columbia and Mount Vernon furnaces in Shenandoah County, and thence by way of Orkney and Rawley Springs to the Dora coalfields, and thence to the West Virginia line. An extension across West Virginia to some point on the Ohio River is also projected. The coalfields are said to yield a good quality of anthracite, but have never been worked to any extent.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of June 28 :

"La Compañía anónima Ferrocarril a San Pedro y trávias de Guadalajara" has asked permission to continue the Zapopan railway which is to connect Guadalajara with Atemajac; that the present limit of time for the completion of lines, now in process of construction, be extended four years; that they may be allowed to follow the public road or whatever route they may deem convenient, and authority to fix the rate of fare.

Wash-outs are still delaying Mexican bound travel. One occurred on the Central road, near El Salto, early Wednesday morning. The road-bed was entirely washed away for 40 or 50 ft., although the rails and sleepers remained in position. The passengers were transferred and brought to the city by another train. The break was promptly repaired. At El Paso the Rio Grande is higher than it has been at any time for 20 years. The bridges are both gone and passengers are ferried over by boat. Along the Texas Pacific and also the Atchison, Topeka & Santa Fe breaks are numerous. The streams are swollen by the melting of the winter snow on the mountains. It is worthy of note in the case of the delays on the Atchison, Topeka & Santa Fe route that they occasion the passengers no extra expense. The company arranges for hotel accommodations and transportation so that all the traveler loses is his time.

Millsap & Mineral Wells.—This company has been organized to build a railroad from Millsap, Tex., on the Texas & Pacific road, northwest to Mineral Wells, in Palo Pinto County, a distance of about 25 miles. Committees have been appointed to secure right of way and subscriptions to the stock.

New York, Lake Erie & Western.—Recently the holders of \$167,000 of this company's car trust bonds were notified that those bonds would be redeemed July 1, and that interest would cease from that date. The holders, however, who presented those bonds for redemption received a circular announcing that the company has not the money on hand to redeem them at present, but hopes to have it in a few days.

This company's statement for May and the eight month

of its fiscal year from Oct. 1 to May 31 is as follows, the figures including 68 per cent. of the gross earnings and all the working expenses of the New York, Pennsylvania & Ohio, the 32 per cent. of the gross earnings paid the leased road as rental not appearing in the accounts at all:

	May.	Eight months.
Earnings.....	\$1,615,364	\$1,883,144
Expenses.....	1,320,791	1,424,933

Net earnings..... \$294,573 \$31,055 \$2,966,448 \$3,987,692

This shows for the eight months an increase of \$878,486, or 6.5 per cent., in gross earnings; an increase of \$1,869,730, or 19.7 per cent., in expenses, and a resulting decrease of \$991,244, or 24.8 per cent., in net earnings. The New York, Pennsylvania & Ohio is included for the entire period this year, but only for one month last year.

The earnings of the Erie lines proper, excluding the New York, Pennsylvania & Ohio altogether, were as follows:

	May.	Eight months.
Earnings.....	\$1,308,545	\$1,660,174
Expenses.....	966,768	1,083,305

Net earnings..... \$341,777 \$578,869 \$3,270,531 \$3,933,505
Per cent. of ex. 73.9 65.3 71.8 69.8

This shows a decrease for the eight months of \$1,430,871, or 10.9 per cent., in gross earnings, with a decrease of \$767,897, or 8.4 per cent., in expenses, and a resulting decrease of \$662,974, or 16.6 per cent., in net earnings.

From these figures we find that the Erie's 68 per cent. of the gross earnings of the New York, Pennsylvania & Ohio road was \$306,819 for May and \$2,175,172 for the eight months, while its working expenses were \$341,628 in May, and \$2,979,256 for the eight months, thus showing a direct loss of \$34,809 for May and \$274,084 for the year.

New York & New England.—The Receiver's statement for May and the five months ending May 31 is as follows:

	May.	Five months.
Earnings.....	\$273,702	\$303,035
Expenses.....	222,067	245,089

Net earnings..... \$51,635 \$57,946 \$26,016 \$98,802
Per cent. of exps.... 81.0 80.8 82.7 92.7

For the five months this shows a decrease in gross earnings of \$50,658, or 3.7 per cent.; a decrease in expenses of \$177,872, or 14.1 per cent., and a resulting gain of \$127,214, or 128.8 per cent., in net earnings.

New York, Ontario & Western.—The committee representing the London and Amsterdam holders of the common stock has completed its inquiry into the condition of this road, and its relations to the New York, West Shore & Buffalo. It is understood that, in the opinion of the committee, most of the troubles have resulted from the fact that the \$2,000,000 preferred stock elected eight of the directors, while the \$58,000,000 of the common stock elected only five. It is further said that this objection has been met by an offer to give the English and Dutch stockholders a full representation in the board, and by the reorganization of the Executive Committee, so as to give the common stockholders one-half of that committee. It is said that the committee will recommend the foreign holders to take part of the \$4,000,000 bonds which are to be issued to fund the floating debt and to replace the preferred stock, leaving the entire voting power in the hands of the common stockholders.

New York, West Shore & Buffalo.—The pay-car, which has now started out on the road, is paying the employés in full for all arrears of wages up to June 9, the date of the receivership. The Receivers expect in future to make payments regularly and in the usual manner, about the middle of each month. The Receivers state that the men on the road have been remarkably patient, and that they have had no trouble at any time from those regularly employed, although some who were discharged have made trouble.

Norfolk & Western.—Work has begun on the extension of the New River Division from Pocahontas, Va., along Bluestone River about four miles, into Mercer County, W. Va. The extension will reach several coal mines which are now being opened.

Northern (New Hampshire).—The preliminary hearing on the bill in equity brought by Samuel H. Dow and other stockholders to set aside the lease of this road to the Boston & Lowell Co. was heard before the New Hampshire Supreme Court in Concord last week. A motion was made and argued for the appointment of a receiver for the Northern road pending a decision as to the validity of the lease. The Court took the matter under advisement, and subsequently decided that the appointment of a receiver was unnecessary. An order was made, however, requiring the accounts of the Northern road to be kept separately, in order that the earnings may be accounted for should the decision be against the lease.

Northern Pacific.—The Land Department reports that the sales for the fiscal year ending June 30 amounted to \$473,712 acres of land for \$2,155,235.

The directors of the company recently authorized President Harris to place under contract 25 miles of the Cascade Division from South Prairie, Wash. T., to Green River, and on June 25 the board further authorized him to let a contract for 25 miles more through the Yakima Valley to Yakima City. At the same meeting the board decided that the terminus of the eastern extension should be at Ashland, on Lake Superior, thus setting aside the plan of completing it through to the Montreal River and the Wisconsin line.

The extension of the leased St. Paul & Northern Pacific road from Sauk Rapids, Minn., to Minneapolis has been completed, and was turned over to the lessee for operation July 1. On the same day the contract for the use of the St. Paul, Minneapolis & Manitoba track between Sauk Rapids and Minneapolis expired, and great efforts had been made to complete the new line by that time. The distance from Sauk Rapids to Minneapolis is 65 miles, and for the whole distance the track is parallel and close to the St. Paul, Minneapolis & Manitoba line. The whole length of the St. Paul & Northern Pacific from Brainerd to Minneapolis is now 125 miles. The completion of the new line gives the Northern Pacific a line of its own to Minneapolis, independent of the use of any leased tracks, the St. Paul & Northern Pacific being entirely under its own control. It will also be enabled to handle local business southwest of Sauk Rapids which the old contract for the use of the Manitoba tracks prevented it from doing. The new freight houses in Minneapolis are not yet quite ready for use but work is progressing upon them. The buildings there include a freight warehouse 700 ft. long and 40 ft. wide and also a new passenger station, although the old union passenger station will be used for the present. An extension from Minneapolis to St. Paul is possibly to be made hereafter. The money for the construction of the new line was obtained by the sale of St. Paul & Northern Pacific bonds, guaranteed by the Northern Pacific, which were placed some time ago. The company owns a large and valuable terminal property on which extensive shops and

other buildings are to be erected. The yards are already laid out.

The earnings of this road for May and the eleven months of the fiscal year from July 1 to May 31, were:

	May.	Eleven months.
Earnings.....	\$1,287,805	\$789,046
Expenses.....	710,403	523,481

Net earnings..... \$577,402 \$266,465 \$4,586,212 \$2,398,360
Per cent. of exps.... 55.1 66.3 60.0 65.8

The gross earnings for the eleven months show a gain of \$4,434,650, or 63.1 per cent., while there was also an increase of \$2,246,798, or 48.6 per cent., in expenses, leaving an increase of \$2,187,892, or 91.2 per cent., in net earnings.

The May earnings fell below those of April by about \$154,000 gross and \$901,000 net. In April, however, the road had an extraordinary business, especially in passengers, partly due to the rush for the new Cœur d'Alene mines. The interest charges for the full year were some time ago estimated at \$3,882,350, and the reported net earnings already exceed that amount by over \$700,000.

Oregonian.—Dispatches from Portland, Oregon, report that Mr. William Reed, of that city, representing a number of local capitalists, will shortly go to Scotland in order to arrange for the purchase of this road. The road, it will be remembered, has been for some time leased to the Oregon Railway & Navigation Co., which company has recently repudiated the lease on the ground that it is illegal. It is chiefly owned in Scotland. The Portland people estimate the expense of putting the road in good condition and of extending it from its present terminus to Portland, a distance of 9 miles, at \$600,000, which sum they will have to expend in addition to whatever they may pay to the Scotch owners of the road.

Oregon Improvement Co.—This company makes the following statement for May and the six months of its fiscal year from Dec. 1 to May 31.

	May.	Six months.
Earnings.....	\$1,884,144	\$1,883,144
Expenses.....	1,320,791	1,424,933

Net earnings..... \$341,777 \$578,869 \$3,270,531 \$3,933,505

Per cent. of ex. 73.9 65.3 71.8 69.8

This shows a decrease for the eight months of \$1,430,871, or 10.9 per cent., in gross earnings, with a decrease of \$767,897, or 8.4 per cent., in expenses, and a resulting decrease of \$662,974, or 16.6 per cent., in net earnings.

From these figures we find that the Erie's 68 per cent. of the gross earnings of the New York, Pennsylvania & Ohio road was \$306,819 for May and \$2,175,172 for the eight months, while its working expenses were \$341,628 in May, and \$2,979,256 for the eight months, thus showing a direct loss of \$34,809 for May and \$274,084 for the year.

New York & New England.—The Receiver's statement for May and the five months ending May 31 is as follows:

	May.	Six months.
Earnings.....	\$273,702	\$303,035
Expenses.....	222,067	245,089

Net earnings..... \$51,635 \$57,946 \$26,016 \$98,802

Per cent. of exps.... 81.0 80.8 82.7 92.7

The decrease in gross earnings for the six months was \$121,778, or 8.9 per cent.; the net earnings, \$147,470, or 30.0 per cent. The increase in expenses was in part due to the charging to expenses of renewals which formerly went into the construction account.

Philadelphia & Reading.—There is still trouble among the employés on the New Jersey Division, a number of them threatening to strike in case they do not receive their back pay. Some who left work for a short time have received their money, and others have appointed a committee to wait upon the Receivers and insist upon the naming of a stated pay day. It is said that a strike will be ordered in case they fail to make definite arrangements. The Receivers promise to pay as soon as possible, but state that the large demands required for interest at the first of the month have made it necessary for them to defer the payment of employees. It is also said that the Receivers have some doubt as to the validity of the lease of the New Jersey roads, and do not wish to pay even the wages unless some decision is reached on this point.

Pittsburgh, Cleveland & Toledo.—The latest report in connection with this road is that negotiations are in progress for a sale or a lease of the road to the Lake Shore & Michigan Southern Co. The road extends from New Castle, Pa., to Akron, O., and it has been expected that it would be sold in connection with the Pittsburgh & Western by the Baltimore & Ohio Co. as part of a short cut between Pittsburgh and Chicago.

A dispatch from Pittsburgh, July 9, says: "The Baltimore & Ohio Railroad Co. has purchased the Pittsburgh, Cleveland & Toledo road, the papers having been signed yesterday. The price paid has not been made known, but it is understood that the Baltimore & Ohio agrees to take care of the paper of the Pittsburgh, Cleveland & Toledo Co. bearing the endorsement of Commodore Garrison, Andrews Bros., of New York and Youngstown, and William McCreery, of this city. The purchase insures the Baltimore & Ohio uninterrupted possession of its present Western connections from Pittsburgh, which would have been broken had the line fallen into Vanderbilt's hands."

Pittsburgh, McKeesport & Youghiogheny.—At a special meeting of the stockholders held in Pittsburgh, July 8, a resolution was passed authorizing the issue of \$1,000,000 in new 6 per cent. bonds having 50 years to run, the proceeds to be used for the construction of new extensions of the road into the Connellsville coke region.

Rutland.—During the past year the present management of this company has paid from its income and other receipts the floating debt which rested upon the road a year ago. Interest upon the bonds has also been paid and a sufficient balance left to pay a dividend of 1 per cent. on the preferred stock, the first for several years.

Saginaw, Tuscola & Huron.—This road is now completed to Bayport, Mich., 12 miles northeast of the late terminus at Sebewaing, and 49 miles from the starting-point at East Saginaw. Regular trains run to the new terminus.

St. Joseph & Southeastern.—This company has filed articles of incorporation in Missouri to build a railroad from St. Joseph southeastward to Smithville, in Clay County, a distance of 40 miles. The road is to be of 3 ft. gauge and the capital stock is fixed at \$200,000.

St. Louis, Fort Scott & Wichita.—This road is now completed to Clearwater, Kans., 21 miles westward from the late terminus at Wichita and 179 miles from Fort Scott.

A recent change in the officers of that company by which Mr. A. L. Hopkins became President, made it apparent that the road has passed under the control of the Missouri Pacific, and that it will hereafter be operated in the interest of that line. It has hitherto been an independent line.

Sodus Bay & Southern.—It is announced that a controlling interest in this road has been sold to the Pennsylvania Railroad Co., and that it will hereafter be operated as a branch or extension of the Northern Central road. The road extends from Stanley, N. Y., on the Northern Central, northward to Sodus Point on Lake Ontario, a distance of 34 miles. It has been sold twice under foreclosure, and has never been a prosperous road, barely earning its running expenses. As a branch of the Northern Central it may, however, be made of some value for shipping coal to Lake Ontario ports.

Texas & St. Louis.—The United States Circuit Court in St. Louis has granted permission to the Receiver to borrow money to make necessary repairs to the road, and to issue certificates for such loans. The certificates are to run one year at 7 per cent., and to be a prior lien on the road.

Texas Western.—In the suit brought against this company by the Gentry estate to recover a claim of about \$200,000, the court has appointed a receiver, taking the

President of the road for that position. The road is a narrow-gauge line running from Houston, Tex., westward 58 miles.

Union Pacific.—The annual reports of this company have given no detailed information regarding the so-called branch lines. The report of the government expert has a tabular statement regarding these lines, which is condensed below. Out of a total of \$40,883,000 bonds outstanding on these lines the Union Pacific Co. holds \$23,615,730, and thus out of the whole annual interest charge of \$2,510,900 the sum of \$1,595,791 is payable to the Union Pacific, leaving only \$915,108 payable to other holders. The net earnings of the branch lines for 1883 only lack \$68,079 of paying the whole interest charge on the bonds. The table for 1883 is as follows:

Name of road.	Gross earnings.	Net earnings.	Annual Interest.	Bonds outstanding.	
Omaha & Repub. Val.	\$454,424	\$165,638	\$129,710	\$1,882,000	
Om., Niobr. & R. H.	193,890	16,639	9,770,000	7	
St. Joseph & West.	1,044,853	274,084	46,200	6,575,000	7
Marysville & Blue V.	38,873	6,519	3,600	128,000	7
Julesburg Branch.	734,646	307,081	33,516	4,788,000	7
Colorado Central.	811,909	246,363	33,160	1,488,000	7
Denver, S. Park & P.	1,555,020	48,743	21,340	1,800,000	6
Greely, Salt L. & F.	62,800	19,97	5,560	803,000	7
Echo & Park City.	98,735	36,345	2,890	480,000	6
Oregon Short Line.	917,894	35,882	16,900	10,774,000	6
Salt Lake & Western.	94,017	49,457	6,100	1,080,000	6
Utah & Colorado & Emporia.	71,146	13,577	2,700	4,000,000	6
June C. & Fort K.	11,506	1,70	750	1,560,000	6
Solomon.	103,215	37,094	9,500	575,000	6
Salina & Southwest.	69,299	25,887	3,400	540,000	6
Denver & Boulder V.	83,720	8,631	3,500	550,000	7
Golden Boulder & C.	23,837	9,079	4,300	60,000	8
Kansas Central.	269,324	45,304	8,080	1,348,000	6
Total.	\$8,758,452	\$2,442,821	\$2,510,900	\$40,883,000	

* Deficit.

Of the St. Joseph & Western bonds this company owns \$2,817,730. On the Oregon Short Line stock—\$10,774,000 in all—the Union Pacific Co. owns \$6,580,000. The Oregon Short Line bonds were issued at the rate of \$20,000 per mile; the average mileage operated during the year was 385, making the average bonds outstanding for the year \$770,000. At 6 per cent. this would make the interest \$462,000.

Measures are being taken to reduce the expenses on this road in every possible way. The through train service has been reduced, the double trains run between Omaha and Ogden for sometime past being replaced by a single through train, the second train running only between Omaha and Cheyenne. There has also been a reduction of through train service on the Kansas Division. A large number of men have been discharged from the Omaha shops and the number of employés is being cut down at other points on the road wherever possible.

The Georgetown Branch of the Colorado Division is now completed to Graymount, Col., 4 miles beyond the latter terminus at Silver Plume, 31 miles from the junction with the main line at Fork's Creek, and 60 miles from Denver. This branch is of 3 ft. gauge, and has very steep grades.

Wabash, St. Louis & Pacific.—A call has been issued to bondholders of Havana Division bonds, which were issued for the purchase of the Champlain, Havana &